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Appendix 3

Performance Criteria
(Table 4.2.4.1 of Long-Term Control Plan)

Table 4.2.4.1
CSO Control Measures, Design Criteria, Performance Criteria, and Critical Milestones

	CSO Control Measure[1]	Description[2]	CSOs Controlled (By Overflow Permit ID)	Design Criteria[2]	Performance Criteria	Critical Milestones[3]
1	Plant Primaries[4]	Upgrade WPCP primaries to achieve peak capacity of 85 mgd and firm capacity of 74 mgd[5].	57; Outfall 002/003	When combined with the rest of the WPCP improvements, provide peak primary treatment capacity of 85 mgd and firm capacity of 74 mgd.	When combined with the rest of the WPCP improvements, facility achieves peak capacity of 85 mgd while complying with effluent limits of current NPDES permit at Outfall 001.	To be completed and in full operation in 2008
2	Plant Phase III[4]	Upgrade remaining WPCP facilities to achieve peak capacity of 85 mgd and firm capacity of 74 mgd[5].	57; Outfall 002/003	When combined with the rest of the WPCP improvements, provide peak secondary treatment capacity of 85 mgd and firm capacity of 74 mgd.	When combined with the rest of the WPCP improvements, facility achieves peak capacity of 85 mgd while complying with effluent limits of current NPDES permit at Outfall 001.	Bid Year - 2014 Achievement of Full Operation - 2015
3	Early Floatables Control	Pilot testing of selected floatables control technologies to assess performance in Fort Wayne[6].	3 pilot locations	CSO-specific; provide instantaneous peak floatables control rate equal to highest annual flow rate in "typical year."	Capture most coarse solids and floatables; design target is to remove one-half-inch diameter and larger solids and floatables.	Commence study - Ongoing Complete study - 2008 Initiate pilot program and make fully operational - 2009 Monitor pilot installations - 2009-2010
4	CSSCIP - Basins with Planned Satellite Storage/Disinfection Technologies[4]	Partial separation projects identified as cost-effective components of the Combined Sewer System Capacity Improvements Program.	45, 61, 62, 64, 51, 52, 53, 54, 68	Storm drains designed as per Fort Wayne Stormwater Standards. Sanitary sewers designed as per Fort Wayne Sanitary Standards and Ten State Standards.	Partial separation of sewers to address basement flooding concerns and reduce local CSOs.	The CSSCIP Program was begun in 1999. The program schedule typically addresses two to three combined sewer subbasins per calendar year. CSSCIP work under this Control Measure will be scheduled in two phases: Phase 1 will address CSO Outfalls 45, 51, 52, 53, and 68, and be completed by 2010; Phase 2 will address CSO Outfalls 61, 62, 64, and 54, and be completed by 2013.
5	Pond Storage & Dewatering	Improvements to CSO Pond 1 to allow storage of combined sewer overflow with subsequent dewatering to WPCP.	When combined with the Parallel Interceptor and Morton Street solution, all CSOs tributary to the Parallel Interceptor, plus CSO 48 and 57, plus Outfalls 002/003	Provide storage capacity of approximately 95 MG.	Achieve 4 overflow events from Ponds[7]	Optimization of existing facilities to allow interim dewatering - 2008 Bid Year for Full Dewatering Capability - 2011 Achievement of Full Operation - 2013
6	CSSCIP - Basins Tributary to PI[4]	Partial separation projects identified as cost-effective components of the Combined Sewer System Capacity Improvements Program.	4, 5, 11, 12, 13, 17, 18, 19, 20, 21, 23, 24, 26, 27, 28, 29, 32, 33, 36, 39, 50, 55, 60 (Note: CSSCIP work associated with Outfalls 17, 26, 27, 28, 33, and 36 already completed as of 2007)	Storm drains designed as per Fort Wayne Stormwater Standards. Sanitary sewers designed as per Fort Wayne Sanitary Standards and Ten State Standards.	Partial separation of sewers to address basement flooding concerns and reduce local CSOs.	The CSSCIP Program began in 1999 and typically addresses two to three combined sewer subbasins per calendar year. Remaining CSSCIP work under this Control Measure will be initiated in 2012 and completed in 2018.
7	Satellite Storage at St. Joseph River CSOs	Satellite storage facilities	45, 51, 53, 68	Provide storage volume of: CSO 45: 0.04 MG CSO 51: 0.76 MG CSO 53: 0.65 MG CSO 68: 1.17 MG	Achieve 1 overflow event[7]	Bid Year (first facility) - 2016 Achievement of Full Operation (final facility) - 2019
8	Satellite Disinfection at St. Joseph River CSOs[8]	Satellite disinfection facility	52	Provide peak disinfection treatment rate of 5.0 MGD[12]	Achieve 1 overflow event[7]; provide treatment to meet NPDES effluent limits for Satellite Disinfection for all other discharge events.[13]	Bid Year - 2013 Achievement of Full Operation - 2014
9	Satellite Disinfection[8]	Satellite disinfection facilities	54, 61, 62	Provide peak disinfection treatment rate of:[12] CSO 54: 1.2 MGD CSO 61: 8.4 MGD CSO 62: 5.8 MGD	Achieve 1 overflow event[7]; provide treatment to meet NPDES effluent limits for Satellite Disinfection for all other discharge events.[13]	Bid Year (first facility) - 2018 Achievement of Full Operation (final facility) - 2021
10	Morton Street/O10101 Reroute	Re-route overflow pump station discharge to CSO Pond 1.	48	Provide peak pumping capacity equal to highest annual flow rate in "typical year."	Achieve 0 overflow events[7]	Bid Year - 2019 Achievement of Full Operation - 2019
11	Wayne Street Parallel Interceptor	Parallel interceptor to capture combined sewer overflows for conveyance to WPCP/CSO Ponds. Begins near CSO 13 (K06298) at western end and discharges into the treatment complex at/near the overflow to the CSO Ponds (Regulator Q06057).	11, 12, 13, 23, 24, 26, 27, 28, 29, 32, 33, 36, 39, 50, 55, 60	Provide approximate instantaneous peak flow rate of 376 MGD at downstream end[9].	Achieve 4 overflow events[7]	Bid Year - 2020 Achievement of Full Operation - 2022
12	St. Marys Parallel Interceptor	Parallel interceptor to capture combined sewer overflows for conveyance to WPCP/CSO Ponds. Begins near CSO 21 (K19044) at southern end and discharges into the Wayne Street Parallel Interceptor.	4, 5, 17, 18, 19, 20, 21	Provide approximate instantaneous peak flowrate of 176 MGD at downstream end[9].	Achieve 4 overflow events[7]	Bid Year - 2023 Achievement of Full Operation - 2025
13	Late Floatables Control	Overflow-specific solids and floatables controls[6].	All CSOs for which floatables not addressed through other facilities	CSO-specific; provide instantaneous peak floatables control rate equal to highest annual flow rate in "typical year."	Capture most coarse solids and floatables; design target is to remove one-half-inch diameter and larger solids and floatables[10].	Bid Year (first facility) - 2020 Achievement of Full Operation (final facility) - 2025
14	Satellite Storage	Satellite storage facility	64	Provide storage volume of 0.23 MG	Achieve 4 overflow events[7]	Bid Year - 2025 Achievement of Full Operation - 2025

Table 4.2.4.1
CSO Control Measures, Design Criteria, Performance Criteria, and Critical Milestones

CSO Control Measure[1]		Description[2]	CSOs Controlled (By Overflow Permit ID)	Design Criteria[2]	Performance Criteria	Critical Milestones[3]
15	CSO Pond High Rate Treatment[11]	Enhanced High Rate Clarification facility, typically referred to by the trade names DensaDeg or ACTIFLO.	When combined with the Parallel Interceptor and Morton Street solution, all CSOs tributary to the Parallel Interceptor plus CSO 48.	TBD	Achieve 4 overflow events[7]	TBD

Footnotes:

(1) Upon full implementation, the CSO Control Measures listed in Table 4.2.4.1 are expected to result in 4 CSO events on the St. Marys and Maumee Rivers and 1 CSO event on the St. Joseph River in a "typical year," as evaluated in accordance with footnote 5 (note: Outfall 48 on the Maumee River will be controlled to 0 CSO events in a "typical year"). Either a revision to Indiana's current water quality standards or some other legal mechanism is necessary to authorize overflows due to storms exceeding those levels of control. In Chapter 5 of the LTCP, the City of Fort Wayne is requesting a revision to the applicable water quality criteria consistent with this level of control through the establishment of a CSO wet-weather limited use subcategory supported by a Use Attainability Analysis (UAA). The design and construction of CSO Control Measures 1, 2, 4, 6, and 10 are not dependent on the level of control ultimately determined, and therefore the City will implement CSO Control Measures 1, 2, 4, 6 and 10 according to the terms and schedules set forth in this Table.

(2) The Description and Design Criteria are based upon LTCP-level planning estimates and may be subject to revision during facility planning and design. One of the conditions of Description and Design Criteria, applicable to all of the facilities set forth in this Table 4.2.4.1, is that the specific facility will be designed in accordance with good engineering practice to ensure that corresponding facility-specific, river-specific, and system-wide Performance Criteria will be achieved.

(3) The term "Bid Year" means "Completion of the Bidding Process."

(4) The CSO Control Measure is not expected to achieve target activation levels on its own, but will work in conjunction with other CSO Control Measures at the specified CSO outfalls to achieve the performance goals.

(5) With all units in service, peak WPCP capacity of 85 mgd can be maintained for over 24 hours.

(6) Implementation of floatables control using industry-standard technologies (e.g., baffles, in-line netting, mechanical screens, passive screens, vortex separators) is contingent on IDEM interpretation of setback requirements. The City's proposed floatables control program assumes that these typical, industry-standard control technologies will continue to not be subject to setback requirements.

(7) CSO Control Measure will be designed to achieve Performance Criteria of 4 CSO events for the St. Marys and Maumee Rivers and 1 CSO event for the St. Joseph River in a "typical year." (Note: Outfall 48 on the Maumee River will be controlled to 0 CSO events in a "typical year"). "Typical year" performance, and achievement of Performance Criteria, is based on average annual statistics over a representative five-year period. The method to assess "typical year" performance over a typical 5-year period will be selected from the options presented in Section 4.6 of Appendix 4 (Post-Construction Monitoring).

(8) The preferred CSO Control Measure for these CSOs is Satellite Disinfection based on the technology screening and selection process conducted by the City. The City will proceed as described in Sectio 4.6 of Appendix 4 to conduct a Satellite Disinfection Pilot Study if it ultimately elects to construct one or more Satellite Disinfection facilities. Alternatively, the City may elect to construct Satellite Storage facilities that will achieve the same Level of Control. The City will construct Satellite Storage facilities in lieu of Satellite Disinfection facilities if it comes to acquire, by January 1, 2010, the wastewater collection and treatment systems currently owned or operated by Utility Center, Inc. (a/k/a AquaSource or Aqua Indiana, Inc.) and connected to the Main Aboite and Midwest wastewater treatment facilities (for which the State has issued NPDES Permit Nos. IN0035378 and IN0042391).

(9) The stated downstream end capacity is the largest capacity required by the referenced Parallel Interceptor. Capacity will decrease, and the parallel interceptor pipe diameter will decrease, in upstream sections due to lower peak flows. This is consistent with standard engineering practice for a pipe that accepts incremental flows from its upstream end to its downstream end. Capacity requirements at interim locations along the Parallel Interceptor are presented in Section 3.3.

(10) Design target of removing one-half-inch and larger solids and floatables will be confirmed or modified based on results of pilot floatables control program (CSO Control Measure 3).

(11) The completed LTCP analysis indicates that the Pond Storage & Dewatering (CSO Control Measure 3) will reduce Pond activations to 4 overflow events per "typical year." Therefore, the CSO Pond EHRC/HRT facility will be constructed only if required to achieve the agreed-upon performance criteria for the Maumee River, i.e. 4 overflow events per "typical year," following completion of CSO Control Measures 5, 11, and 12.

(12) Required disinfection protocol and associated effluent limits for flows up to and including the peak flowrate shall be defined as noted in Section 4.6 of Appendix 4.

(13) If Satellite Disinfection technology is utilized, NPDES effluent limits shall be as noted in Section 4.6 of Appendix 4.

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Post-Construction Monitoring Program (Section 4.6 of Long-Term Control Plan)

4.6 Post-Construction Monitoring Program

4.6.1 Introduction

The City's CSO Long-Term Control Plan will implement a series of aggressive controls to dramatically reduce the amount of combined sewage discharged to the St. Joseph, St. Marys, and Maumee Rivers. While CSOs are only one of many pollutant sources impacting the rivers, it is expected that CSO control will result in a net benefit to the rivers and improve water quality. The purpose of the Post-Construction Monitoring Program is to assess performance of the City's CSO Control Measures and to add to the City's ongoing investigation of overall stream conditions, including tracking changes in water quality over time.

This section describes the key elements of the proposed program for post-construction monitoring activities. The Post-Construction Monitoring Program has been developed to assess the performance and observable water quality impact of CSO control measures as they are implemented, while integrating with the City's ongoing water quality monitoring program (a part of which operates under a cooperative agreement with IDEM). From a regulatory perspective, the Post-Construction Monitoring Program will document the effectiveness of the City's overall CSO control program in achieving performance requirements. The elements of the program are as follows:

- A monitoring schedule, identified sampling locations, and associated monitoring procedures to collect data associated with the Performance Criteria (presented in Table 4.2.4.1) and *E. coli* levels in CSO-impacted receiving streams.
- Analysis of collected data to determine whether CSO control measures are meeting the Performance Criteria presented in Table 4.2.4.1.
- Analysis of the collected data to assess long-term trends in instream *E. coli* levels, and documentation of any environmental benefits that occur as the LTCP is implemented.
- Evaluation and analysis of the data for reporting status and progress to regulatory agencies and the public.

The City's Post-Construction Monitoring Program will be implemented on a river-watershed basis, beginning on the St. Joseph River, followed by the Maumee River, followed by the St. Mary's River. This progression is guided by the implementation schedule for CSO controls, and allows for assessment of environmental benefit on a waterbody basis. The monitoring program will assess the control program's effectiveness at meeting river-specific Performance Criteria – 1 overflow event[1] on the

[1] An "*overflow event*" is as defined in the Presumption Approach of the CSO Control Policy – "*an overflow event is one or more overflows from a CSS as the result of a precipitation event.*" For the purposes of the City's selected CSO Control Measures, the definition is applied on a river system basis, i.e. independently to the St. Joseph River and the St. Marys/Maumee river system, rather than a full combined sewer system (CSS) basis. Furthermore, discrete overflow events are defined as being separated by a 6-hour or longer inter-event duration, consistent with the methodology and analysis presented in the City's LTCP.

St. Joseph River in a typical year and 4 overflow events on the St. Marys/Maumee River system in a typical year. The frequency of CSO overflow events will vary year-to-year because of variation in annual rainfall. For example, where the level of control is 4 overflow events per typical year, actual overflow frequency is expected to range from 0 to 10 overflow events per year (it should be noted that it is not possible to put a firm upper bound on this range due to rainfall variability).

The City views the Post-Construction Monitoring Program as a key mechanism for supporting dialogue with the regulatory agencies and the public. Fort Wayne City Utilities will compile monitoring results, submit milestone reports to regulatory agencies, and use the information to report progress to the public.

4.6.1.1 Regulatory Requirements

U.S. EPA requires CSO communities to conduct a post-construction monitoring program during and after LTCP implementation "to help determine the effectiveness of the overall program in meeting [Clean Water Act] requirements and achieving local water quality goals."[2] This program will collect data that measures the effectiveness of CSO controls and their impact on water quality, and intends to utilize existing monitoring stations used in previous studies of the waterways and sewer system in order to compare results to conditions before controls were put in place. The program will include a map of monitoring stations, a record of sampling frequency at each station, a list of data to be collected, and a quality assurance/quality control (QA/QC) plan.

In U.S. EPA's December 2001 Report to Congress: Implementation and Enforcement of the Combined Sewer Overflow Control Policy, the agency noted the difficulty of establishing a monitoring and tracking program for CSO control programs. "Monitoring programs need to be targeted and implemented in a consistent manner from year to year to be able to establish pre-control baseline conditions and to identify meaningful trends over time as CSO controls are implemented," the report said. "In practice, it is often difficult, and in some instances impossible, to link environmental conditions or results to a single source of pollution, such as CSOs. In most instances, water quality is impacted by multiple sources, and trends over time reflect the change in loadings on a watershed scale from a variety of environmental programs." The report also noted that weather conditions and rainfall totals vary significantly from storm to storm and year to year, making comparisons difficult.

4.6.1.2 Purpose & Scope

This Post-Construction Monitoring Program will collect the necessary data to assess the impact of the City of Fort Wayne's CSO LTCP. CSO controls are expected to provide two positive impacts:

- First, control CSOs to the Performance Criteria provided in Table 4.2.4.1. The monitoring program will collect the requisite end-of-pipe data to assess performance of the controls.

[2] *Combined Sewer Overflows, Guidance for Long-Term Control Plan* (EPA 832-B-95-002, August 1995) p. 4-15.

- Second, improve water quality on local rivers. As noted in U.S. EPA's Report to Congress, "...it is often difficult, and in some instances impossible, to link environmental conditions or results to a single source of pollution, such as CSOs." However, the monitoring program will collect the requisite instream data to assess the trends over time as CSO controls are implemented. In order to compare post-construction water quality trends to current conditions and historic data, the proposed monitoring program makes use of all of the City's current water quality monitoring stations.

In addition to collecting data to assess CSO control performance and instream water quality trends, the Post-Construction Monitoring Program will develop documentation to support regulatory reporting requirements and communicate with the public.

The waterbodies included in this plan are the St. Joseph River, the Maumee River, and the St. Marys River. The City's monitoring program is a part of the following overall scope of work:

- Document Current Baseline Conditions: During development of the LTCP, the City conducted a significant amount of characterization work. The results of the characterization and documentation of current baseline conditions are presented in Chapter 2.
- Identify Parameters of Concern: During the system characterization effort and through subsequent discussions with U.S. EPA and IDEM, the City identified *E. coli* bacteria as the parameter of concern in local waterbodies. This decision process is described in more detail in Chapter 2. Therefore, the City will use *E. coli* (or other applicable pathogen or pathogen indicator as described below in Section 4.6.2.2) to measure the effect of its long-term CSO control measures on receiving streams.
- Prepare and execute Post-Construction Monitoring: The City's monitoring program is the focus of this section 4.6, with individual elements and approach described in detail in Sections 4.6.2 through 4.6.6.
- Report Results to State and Federal Agencies: The results and observations from the post-construction monitoring will be provided to U.S. EPA and IDEM through a series of milestone reports and a final report. A milestone report will be prepared for each of the three river watersheds, when all the CSO controls in a particular river watershed are operational. The reports will provide documentation of facility performance relative to the Performance Criteria in Table 4.2.4.1, along with a presentation of observed water quality trends. Section 4.6.7 presents the City's plan for reporting progress to the regulatory agencies.
- Provide Public Information on Water Quality: Fort Wayne City Utilities will continue distributing information on the CSO LTCP, including water quality issues, to the public through the program described in Chapter 7 of the Combined Sewer System Operational Plan (CSSOP).

4.6.2 Program Elements

The City of Fort Wayne will implement the CSO Long-Term Control Plan as a series of CSO Control Measures according to the schedule provided in Table 4.2.4.1. The CSO Control Measures have been grouped for implementation purposes according to priority and required engineering sequencing. Milestones in the implementation process can be defined in terms of river watersheds, where the St. Joseph River controls will be fully implemented by 2019, the Maumee River controls by 2022, and the St. Marys River controls by 2025. At each implementation milestone, the City will proceed with the data evaluation and progress reporting to assess compliance with the Performance Criteria in Table 4.2.4.1 and document improvements in instream water quality conditions. Note that the while the Maumee River post-construction monitoring will begin in 2022, the full impact of CSO Control Measures on Maumee River water quality will be realized in 2025 once the controls in the upstream St. Marys River watershed are fully implemented.

4.6.2.1 Performance Criteria

The Performance Criteria for the City's CSO Control Measures are expressed as number of activations in a typical year. The required Performance Criteria - 1 overflow event on the St. Joseph River in a typical year, 4 overflow events on the Maumee River in a typical year, and 4 overflow events on the St. Marys River in a typical year - are provided in Table 4.2.4.1. As explained in Section 4.6.1 above, the actual frequency of CSO overflow events will vary year-to-year because of variation in annual rainfall. The City will assess the average performance of CSO control measures by river watershed following the Achievement of Full Operation of the full set of controls for each river watershed. The assessment of performance, and the resulting determination of compliance with the Performance Criteria during a typical year, will be performed with a combination of outfall monitoring and collection system modeling and documented in Table 4.6.2.1. A full explanation of the performance assessment is provided in Section 4.6.4.

4.6.2.2 Water Quality Measures

The Water Quality Measures are data-based indicators of instream water quality, in particular the long-term trends in expected improvements due to implementation of the City's CSO Control Measures. A strong baseline of existing water quality conditions in the rivers has already been established through the City's ongoing water quality monitoring program. The water quality component of the Post-Construction Monitoring Program will continue to collect instream samples during and after implementation of the CSO Control measures in order to document changes in water quality conditions.

The Water Quality Measure incorporated in the City's Post-Construction Monitoring Plan is *E. coli* bacteria (or other pathogen indicator, to the extent applicable water quality standards have been revised to include a different applicable pathogen indicator). Bacteria has been established as the parameter of concern with respect to CSO control, based on the City's completed system characterization efforts and discussion with U.S. EPA and IDEM.

The City will collect data to measure and evaluate improvements to instream *E. coli* bacteria counts that can be attributed, at least in part, to CSO control measures. It is unlikely that CSO controls alone will result in attainment of Indiana's *E. coli* standards for primary contact recreation due to numerous *E. coli* sources in the environment. Because the e. coli counts in water bodies may be subject to contribution from various sources, for the purpose of determining compliance with this decree, an in-stream water quality value will not be imposed. Rather, the City will analyze trends in both dry-weather and wet-weather *E. coli* levels and compare them to historic monitoring data and modeling predictions to determine improvement in water quality and to ensure that residual CSO discharges do not interfere with applicable recreational uses (to be determined through the City's Use Attainability Analysis). A different pathogen indicator other than *E. coli* may be requested by IDEM in accordance with this paragraph to the extent the applicable water quality standards are revised to include a different pathogen indicator.

4.6.3 Post-Construction Monitoring and Data Collection

This section details the field program that the City will implement to support the overall Post-Construction Monitoring Program. The field program combines CSO outfall flow monitoring, a pilot CSO disinfection study, river water quality sampling, WPCP effluent sampling, and rainfall monitoring to collect the data necessary for characterizing the benefits of implemented CSO Control Measures.

4.6.3.1 Monitoring Schedule

By definition, the post-construction monitoring schedule is dictated by the construction schedule for the City's LTCP. As shown in Table 4.6.2.1, post-construction monitoring will begin after completion of all LTCP projects in the St. Joseph River watershed. Post-construction monitoring will continue through implementation of the other groups of watershed controls (on the Maumee River and St. Marys River), and provide the data for the Final Post-Construction Monitoring Report (scheduled for submission within five years following Achievement of Full Operation of all LTCP projects). After review of the Final Post-Construction Monitoring Report by U.S. EPA and IDEM, the City will modify the Post-Construction Monitoring Program as appropriate to satisfy ongoing reporting requirements.

While post-construction monitoring cannot begin until associated construction phases are completed, the City intends to continue its current monitoring programs until the St. Joseph watershed controls are implemented. As explained below, the current CSO outfall flow monitoring locations and river water quality sampling locations will also serve as the post-construction monitoring locations. Therefore, these current programs will provide an ongoing understanding of CSO performance and instream water quality conditions prior to post-construction monitoring. This data will provide the necessary baseline from which to assess the impact and benefit of implemented CSO Control Measures.

4.6.3.2 Monitoring Stations

The City's current monitoring programs have been designed to fully characterize the existing system in terms of CSO discharges and receiving water quality trends. The following stations are included in these current programs:

- *Stream monitoring.* The USGS maintains five gauging stations in and around Fort Wayne, one each on the St. Joseph River and St. Marys River, and three on the Maumee River.
- *CSO outfall flow monitoring.* Of the City's 44 permitted CSO discharge points:
    - 33 locations are monitored with continuous depth/velocity meter configurations
    - 5 locations are monitored via pump runtime meters at overflow pump stations.
    - 3 locations (007, 012, 027) are emergency gravity discharges at overflow pump stations. These emergency overflows are not monitored, as they activate only when the associated pump stations fail.
    - 2 locations (003 and 081) are visually inspected to determine activation. Visual inspections occur daily on weekdays, and during runoff events on weekends and holidays.
    - 1 location (014) has very low flows and typically activates less than once per year.
- *River water quality sampling.* The City collects water quality samples at the following six locations in cooperation with IDEM:
    - Mayhew Road Bridge – St. Joseph
    - Tennessee Avenue Bridge – St. Joseph
    - Ferguson Road Bridge – St. Marys
    - Spy Run Bridge – St. Marys
    - Anthony Boulevard Bridge – Maumee
    - Landin Road Bridge – Maumee

  Monthly sampling is conducted with IDEM on a year-round basis. The City augments the monthly program with weekly sampling from April 1 to October 31.
- *WPCP effluent monitoring.* Per NPDES permit requirements, the City collects effluent samples at Outfall 001.
- *Rainfall monitoring.* The City maintains a network of 10 rain gauges, distributed over the service area to adequately capture typical rainfall patterns and distributions.

Given that the above monitoring locations were designed to properly characterize the existing system and receiving water conditions, often in concert with U.S. EPA and/or IDEM, the City has identified them as the proper monitoring locations for the Post-Construction Monitoring Program. CSO discharge locations will not change (other than through elimination), and river flow patterns will remain the same, following implementation of the CSO Control Measures. Therefore, these monitoring locations are appropriate for the purposes of the Post-Construction Monitoring Program – to assess compliance with CSO Performance Criteria, and document improvements to water

quality over time. Additional details on these programs and locations are provided below in Sections 4.6.3.3 through 4.6.3.7.

The City's current (and post-construction) monitoring station locations, along with the reasons for selection, monitoring equipment types, monitoring frequencies, and monitoring parameters are presented in Table 4.6.3.1. The locations of these stations are displayed on Figure 4.6.3.1. The City's distributed rain gauge network is also shown on Figure 4.6.3.1.

The City may, after consultation and agreement with U.S. EPA and IDEM, add, modify, remove, or relocate monitoring stations, as necessary, during or after implementation of CSO Control Measures to address any changes that may be necessary as a result of facility planning, design, and construction.

4.6.3.3 Stream Monitoring

The USGS maintains five real-time stream gauging stations in and around Fort Wayne, with one each on the St. Joseph River and St. Marys River, and three on the Maumee River, as shown on Figure 4.6.3.1. Four of these stations monitor stage in the streams, which the USGS then uses to estimate flow. The fifth station monitors stage only. The City has used and intends to continue using this USGS data to provide long-term stream monitoring as part of their wet-weather program. As with all USGS gauging stations, standard equipment, procedures, and protocols will be used for data collection, and USGS personnel are responsible for maintenance, calibration, and data processing at these locations.

4.6.3.4 CSO Outfall Monitoring

4.6.3.4.1 Outfall Monitoring for Activations

The primary purpose of CSO outfall monitoring in the Post-Construction Monitoring Program is to determine if CSO Control Measures are complying with the Performance Criteria in Table 4.2.4.1.

The City is currently monitoring 33 CSO outfalls with continuously recording flow meters (depth/velocity meters), allowing estimates of overflow onset, duration, and volume. An additional 5 locations are monitored via pump runtime data at overflow pump stations, again allowing estimates of overflow onset, duration, and volume. The remaining 6 permitted outfalls are either emergency overflows (3 locations), visually inspected overflows using blocking to estimate activations (2 locations), or very low activity/volume overflows (1 location).

The City will continue monitoring these CSO outfalls until the initiation of post-construction monitoring (at the completion of the St. Joseph River watershed CSO Measures). The City may, after consultation and agreement with U.S. EPA and IDEM, change the monitoring equipment and protocols at selected locations during this time. For example, at locations where the depth/velocity meters are consistently problematic,

or show that a CSO activates very infrequently and at low volume, the City may change to a simpler activation only monitoring scheme.

As part of initiating the post-construction monitoring, the locations and/or equipment associated with some monitoring sites may change to accommodate post-construction configurations. These changes will be discussed with U.S. EPA and IDEM prior to implementation.

4.6.3.4.2 Outfall Monitoring for Assessing Satellite Disinfection Performance

The City is proposing to construct four satellite disinfection facilities as a CSO Control Measure for Outfalls 52, 54, 61 and 62. However, the City will construct satellite storage facilities in lieu of satellite disinfection facilities if it comes to acquire, by January 1, 2010, the wastewater collection and treatment systems currently owned or operated by Utility Center, Inc. (a/k/a AquaSource or Aqua Indiana, Inc.) and connected to the Main Aboite and Midwest wastewater treatment facilities (for which the State has issued NPDES Permit Nos. IN0035378 and IN0042391). If the City does not acquire the aforementioned wastewater treatment and collection systems currently owned and operated by Utility Center, Inc. within the specified timeframe, it is not required to, but may nonetheless elect to, construct one or more satellite storage facilities in lieu of satellite disinfection facilities as the CSO Control Measure for Outfalls 52, 54, 61 and/or 62. The effectiveness and required performance standards for any such satellite disinfection facilities in terms of pathogen control are dependent on a wide range of factors, and defining the performance of installed facilities is of high interest to the City and EPA/IDEM. If the City utilizes satellite disinfection instead of the other viable satellite control option, satellite storage, at these locations, the following conditions will apply to use of satellite disinfection. .

A pilot disinfection facility shall be constructed at Outfall 52 per the schedule specified in Table 4.2.4.1. After achievement of full operation, this facility shall be studied to determine the effectiveness of disinfection of the flows entering the facility. The testing duration and protocol shall be per the City of Fort Wayne CSO Satellite Disinfection Pilot Study (Attachment 1). The effectiveness of disinfection will be measured using the testing protocol, in order to document the ability of the facility to attain the following performance measures at a minimum:

- Skimming or screening (or equivalent) of the detained flows to remove solids and floatables and proper disposal of all material in accordance with all applicable solid waste disposal laws and regulations
- Detention of flows for settling, combined with other solids removal mechanisms associated with solids and floatable control, to achieve the Total Suspended Solids (TSS) removal necessary for effective disinfection. Minimum detention period is 30 minutes.
- Disinfection of all detained flows to *E. coli* effluent limitation contained in the current NPDES permit.

- Dechlorination, if necessary, of all detained flows to the effluent limitation for Total Residual Chlorine (TRC) contained in the current NPDES permit.

If the results of the study indicate that the disinfection facility constructed at Outfall 52 does not provide effective disinfection, the City will follow the provisions outlined in the sections of the Consent Decree entitled, "*Extension of Deadlines to Achieve Performance Criteria*" and/or the "*Modification of Performance Criteria*" to identify the appropriate controls required to meet the activation performance criteria for Outfall 52, 54, 61 and 62. Conversely, if the study results indicate that the pilot satellite disinfection facility does provide effective disinfection, the City will proceed to construct the remaining satellite disinfection facilities in accordance with Tables 4.2.3.1 and 4.2.4.1 unless the City decides to install satellite storage facilities at the specified locations.

4.6.3.5 Water Quality Monitoring

The City currently collects water quality samples at six locations as part of a cooperative river water quality sampling program with IDEM. Samples are collected once per month on a year-round basis in support of the IDEM program; the City increases the frequency to weekly sampling during the period April 1 to October 31. All samples are analyzed for the following parameters:

- Field measurements are taken for pH, Dissolved Oxygen, and temperature.
- *E. coli*
- Ammonia-Nitrogen
- Total Phosphorus
- Total Suspended Solids

In addition, the monthly samples collected under the cooperative program with IDEM are analyzed for a range of metals including cadmium, copper, lead, and zinc.

This program will continue up until and after initiation of the Post-Construction Monitoring Plan (scheduled to start after completion of the St. Joseph CSO watershed controls). In this way, the City will have a strong baseline dataset to determine changes in water quality over time.

Sampling and analysis for *E. coli* bacteria (or other pathogens) is required under this Post-Construction Monitoring Plan, since it has been identified as the water quality measure for the Plan as explained in Section 4.6.2.2. The City will also continue, at its discretion, sampling and analysis for the other parameters listed above.

4.6.3.6 WPCP Effluent Monitoring

The City will continue monitoring the WPCP effluent as required by current and future NPDES permits.

4.6.3.7 Rainfall Monitoring

The City has a network of 10 rain gauges to measure rainfall across the service area. This network has been in place since 1983, and is currently maintained by the City's dedicated

CSO crew. The distribution of gauges in the network has been configured to properly represent temporal and spatial rainfall patterns in the Fort Wayne area.

The City intends to maintain the current rain gauge network (or equivalent) up until and after initiation of the Post-Construction Monitoring Program. The collected rainfall data will support the wet-weather analyses and modeling described below in Section 4.6.4.

4.6.4 Data Retrieval, Management and Analysis

Two kinds of data will be collected, managed, and analyzed as part of the City's Post-Construction Monitoring Program – continuous flow data collected at CSO outfalls and discrete water quality data collected at river monitoring sites. Both of these data types are currently being collected as part of the City's ongoing monitoring program; as a result, the new data collected as part of the Post-Construction Monitoring Program will be integrated into existing data validation, archiving, retrieval, and management tools. The City will continue taking all necessary measures to ensure that monitoring objectives are attained.

This section first describes each of the data types, then presents the City's plan for using and analyzing the outfall flow data and collection system modeling tools to assess compliance with the Performance Criteria in Table 4.2.4.1.

The City has been collecting system-wide CSO outfall flow data since 2004 using flow meters and data management software provided by ADS Environmental Services (ADS). The City will have ongoing access to ADS's flow data management software (or equivalent) for the duration of the Post-Construction Monitoring Program. This software, known as Intelliserve, provides full functionality for archiving, retrieving, managing, and analyzing flow data. In addition, the City uses their telemetry system to collect necessary data at the five CSO locations monitored with pump runtime meters.

The City has been collecting water quality data on the St. Joseph, Maumee, and St. Marys Rivers under various programs since the 1990s. The current sampling program collects monthly samples on a year-round basis and weekly samples from April 1 through October 31 at six sites. Field measurements are taken for pH, Dissolved Oxygen, and temperature. Sample volumes are also transported to the WPCP laboratory and analyzed for *E. coli*, Ammonia-Nitrogen, Total Phosphorus, and Total Suspended Solids.

Consistent with the current monitoring programs, all personnel involved in the Post-Construction Monitoring Plan will be experienced and familiar with the requirements of the data collection program. Given the duration of the City's LTCP program and post-construction monitoring period, it is likely that data management and analysis techniques will evolve and improve within the wet-weather industry over the duration of the implementation period. If this occurs, any recommended changes to the City's approach will be discussed with U.S. EPA and IDEM to ensure consensus prior to implementation.

A primary purpose of the Post-Construction Monitoring Program is to assess compliance with the Performance Criteria set forth in Table 4.2.4.1. In order to assess the

Performance Criteria in terms of CSO activations, the City is proposing a model-based approach similar to the method recently approved for the City of Indianapolis, Indiana. In addition, given the importance of the assessment process, and recognizing that methods to assess average performance of CSO control measures per the CSO Policy are in their infancy, the City is allowing for the possibility that an improved alternative, or modified, approach may be identified in the future.

4.6.4.1 Model-Based Approach to Assessing Compliance

The City of Fort Wayne began its collection system modeling program in the late 1990s, and developed a fully dynamic, planning-level collection system model to support development of the Long-Term Control Plan. As explained in Chapter 2, the City's model was reviewed and approved for LTCP development purposes by U.S. EPA and IDEM in 2005.

Under the model-based approach, the City would update and utilize their collection system model to determine whether operational CSO Control Measures have achieved compliance with the Performance Criteria set forth in Table 4.2.4.1. At least two (2) years prior to the initiation of post construction monitoring on the first river-watershed, Fort Wayne shall propose to EPA and IDEM, in writing, the five years it has selected as a five year period for a typical year. The City would take the following steps under this approach, with each step guided by modeling industry standards and sound engineering judgment:

1. Collect CSO outfall data for a 12-month post-construction monitoring period in each watershed in accordance with Section 4.6.3.4.
2. Perform quality assurance and quality control of the data collected in Step 1.
3. Utilize the model (incorporating the improved collection system) in its previously-calibrated state and the rainfall data collected during the monitoring period, to run a continuous simulation of CSO discharges for the 12-month post-construction monitoring period.
4. Compare the continuous simulation outputs to the CSO monitoring data for the 12-month post-construction monitoring period to determine whether re-calibration of the collection system model is needed. Model re-calibration will not be needed if the model achieves at least the same degree of calibration as was achieved for pre-CSO Long-Term Control conditions during the LTCP development process, and there is a high degree of agreement between the model output and CSO monitoring data for activation frequency for the 12-month post-construction monitoring period. Otherwise, model re-calibration will be needed in accordance with Steps 5-7.
5. If re-calibration is needed, select two or more appropriate rainfall events from the 12-month post-construction monitoring period for model recalibration. The City will apply the standard of practice used in the collection system modeling industry in selecting the best candidate events for model calibration.
6. Develop an initial data set for use with the model and perform successive applications of the model with appropriate parameter adjustment until there is a

high degree of agreement between the model output and the CSO monitoring data for the selected recalibration events. In making such adjustments, the City will consider the inherent variability in both the collection system model and in flow monitoring data, and will exercise sound engineering judgment and best industry practices so as to not compromise the overall representativeness of the model.

7. Once the model has been re-calibrated in accordance with Step 6, the City will verify the re-calibrated model by again utilizing the model and the rainfall data collected during the 12-month post-construction monitoring period, to run another continuous simulation for the 12-month post-construction monitoring period. The City will again compare the continuous simulation outputs to the CSO monitoring data for the 12-month post-construction monitoring period as described in Step 4, to determine whether additional re-calibration of the collection system model is needed. Re-calibration will be determined to be adequate if the model achieves at least the same degree of calibration, as was achieved for pre-CSO Long-Term Control conditions during the LTCP development process, and there is a high degree of agreement between the model output and CSO monitoring data for activation frequency for the 12-month post-construction monitoring period. Otherwise, further re-calibration will be needed in accordance with these Steps 5-7 until the model achieves at least the same degree of calibration as was achieved for pre-CSO Long-Term Control conditions during the LTCP development process, and there is a high degree of agreement between the model output and CSO monitoring data for activation frequency for the 12-month post-construction monitoring period.
8. Once the City has satisfactorily re-calibrated the model in accordance with Steps 5 through 7 (or shown that recalibration is not necessary in accordance with Step 4), the City will then utilize the original model (if recalibration was determined not to be necessary in accordance with Steps 4-7) or the recalibrated model to run a continuous simulation for a representative five-year period agreed to with IDEM and U.S. EPA. The model results for this five-year simulation will be used to determine whether the City has achieved the Performance Criteria set forth in Table 4.2.4.1.
9. The City shall be deemed to have achieved the Performance Criteria if the five-year simulation shows that there were a total of 24 or fewer CSO events into the Maumee River and St. Marys River watershed for the five-year period, and a total of 6 or fewer CSO events into the St. Joseph River watershed for the five-year period, following construction of the necessary Control Measures in Table 4.2.4.1.
10. The overflow frequency performance criterion is based upon a "typical year," calculated using the 5-year continuous simulation of the collection system model, as described above. If the modeled average annual overflow frequency is less than or equal to 1.2 for the St. Joseph River and 4.8 for the Maumee and St. Marys Rivers, the system is deemed to be in compliance with the performance criteria of 1 and 4 overflow events per year. This "rounding" is appropriate due to the inherent variability in model predictions. If the modeled overflow frequency exceeds 1.2 for the St. Joseph River and/or 4.8 for the Maumee and St. Marys Rivers, then the City will prepare a Milestone Report of this negative result under

Paragraph 4.6.6.1. The City may include an analysis of the following in the Milestone Report: (1) the volume, frequency, and factors causing the additional overflow frequency, (2) any impact on water quality, including designated uses, from the additional overflow frequency, (3) control options, if any, to reduce the frequency towards 4/1 (as appropriate), (4) associated costs for any additional control options, (5) any expected benefits from such control options and (6) a recommendation as to whether the City should proceed under Section XXI.D, XXI.E or another provision of the Consent Decree.

It is important to note that percent capture has not been identified as a formal Performance Criterion for the City's LTCP. Based on discussions with U.S. EPA and IDEM during development of the final recommended plan, average annual overflow frequency was identified as the controlling Performance Criterion and is identified as such in Table 4.2.4.1. However, the City recognizes that percent capture can sometimes be useful in assessing performance of a combined sewer system, and will continue to develop estimates of percent capture based on the 5-year simulations described above. These estimates will be included in documentation of system performance included in the Milestone Reports described in Section 4.6.6.1.

The City also plans to use their collections system model to support the process of refining the planning-level LTCP concepts into specific CSO control projects. This will require selected improvements to the level of detail and calibration of the model on an as-needed basis over the next 18 years. This process of refining the model to meet specific project needs has always been anticipated, and is consistent with the modeling approach followed by the City since the 1990s. The model is a valuable and dynamic tool that the City will use as appropriate to further system understanding from a design, operation, and maintenance perspective as they pursue their goal of improving water quality on local rivers.

4.6.4.2 Alternate Compliance Assessment Approach

The City may propose an alternate compliance assessment approach other than that described in Section 4.6.4.1. Such an alternate compliance assessment approach may be implemented by the City, in lieu of that described in Section 4.6.4.1, if approved by U.S. EPA and IDEM and subject to other approvals, if any, required by Section XXI of the City's Consent Decree. In order to provide sufficient time for agency review and approval to allow timely implementation, any proposal by the City for use of an alternative compliance assessment approach should be submitted to U.S. EPA and IDEM no later than December 31, 2015.

4.6.5 Quality Control

The City has Standard Operating Procedures (SOPs) in place for both of the core activities in the Post-Construction Monitoring Program, CSO outfall flow monitoring and river water quality sampling. Both of these programs have been ongoing in their current form since at least 2004, allowing for 3 years of field experience and identification of

potential difficulties. The SOPs for these two programs are included in the Combined Sewer System Operational Plan.

All activities under the Post-Construction Monitoring Program will be implemented with appropriate quality control standards, including potential updates to the standards in response to industry trends. While the detailed procedures associated with many activities have in-place SOPs (as explained above), a general summary of the quality control procedures follows.

- Streamflow data is collected by the USGS under their typical quality control procedures. The City makes use of this streamflow data as part of their wet-weather program.
- CSO outfall flow monitoring is conducted by a dedicated CSO crew, following SOPs for maintenance, equipment replacement, data downloads, and associated field activities. Flow data is reviewed for validity and representativeness by the Program Manager of Wet-Weather Operations.
- The proposed City of Fort Wayne CSO Satellite Disinfection Pilot Study will be performed per the quality control requirements outlined in Attachment 1.
- River water quality sampling is performed by trained Industrial Pretreatment staff. Standard sampling procedures and documentation are a required part of the program, including use of chain-of-custody forms, appropriate sample preservation techniques, etc.
- Laboratory analysis of water quality samples is performed by the City's certified WPCP laboratory. The City's laboratory follows all standard and required protocols and documentation needs.
- Rainfall data is downloaded and archived by the dedicated CSO crew responsible for the CSO outfall monitoring program. Rain gauge field work and downloading activities are included in the flow monitoring program SOP.

4.6.6 Data Evaluation & Progress Reporting

As part of the City's agreement with U.S. EPA and IDEM, regular reporting of activities and progress is required for the duration of the LTCP implementation process. Biannual reports are required under the Consent Decree, and these will include updates on the Post-Construction Monitoring Program as appropriate. In addition to the reporting required under the Consent Decree, the City will provide the Milestone Reports and Final Report described below to U.S. EPA and IDEM specifically for the Post-Construction Monitoring Program.

A second purpose for the progress reporting is to keep Fort Wayne's public ratepayers aware of the City's progress. A key goal of the City's overall wet-weather control philosophy is to ensure that public monies are spent in an effective and prudent manner. As part of pursuing that goal, the City is committed to keeping the public informed on where, how, and to what benefit their money is being spent.

As explained previously in this plan, and recognized by U.S. EPA in their December 2001 Report to Congress, "it is often difficult, and in some instances impossible, to link

environmental conditions or results to a single source of pollution, such as CSOs. In most instances, water quality is impacted by multiple sources, and trends over time reflect the change in loadings on a watershed scale from a variety of environmental programs." Therefore, it is unlikely that the reports described below will be able to definitively link any measurable water quality indicator to in-place CSO controls. However, the City's reporting will document progress towards complying with the Performance Criteria in Table 4.2.4.1, along with progress towards the common goal of improving instream water quality.

A summary of the schedule for the Milestone Reports and Final Report is presented in Table 4.6.6.1. As can be seen, the Milestone Reports provide an explicit mechanism for demonstrating compliance with the Performance Criteria set forth in Table 4.2.4.1 by 2027, or two years after Achievement of Full Operation for all CSO Control Measures. If compliance is demonstrated in 2027, the City will have satisfied the Performance Criteria for CSO Control Measures required under the Consent Decree. If compliance is not demonstrated in 2027, the final Milestone Report will include an analysis of the following: (1) the volume, frequency, and factors causing the additional overflow frequency, (2) any impact on water quality, including designated uses, from the additional overflow frequency, (3) control options, if any, to reduce the frequency towards 4/1 (as appropriate), (4) associated costs for any additional control options, (5) any expected benefits from such control options and (6) a recommendation as to whether the City should proceed under Section XXI.D, XXI.E or another provision of the Consent Decree.

4.6.6.1 Milestone Reports

After Achievement of Full Operation of all LTCP projects in a specified river watershed (St. Joseph River, Maumee River, or St. Marys River), the City will prepare and submit a Milestone Report to the U.S. EPA and IDEM. The Milestone Report for each watershed will be submitted within two years following Achievement of Full Operation of the applicable CSO project(s), and include data related to the following information:

- Description of river and CSO controls being implemented
- CSO monitoring and rainfall monitoring results
- River water quality sampling results
- Evaluation of the effectiveness of CSO Control Measures, including results of analyses performed to assess whether the implemented controls are complying with the Performance Criteria in Table 4.2.4.1.
- A discussion of any significant variances from the Performance Criteria, including impacting factors and associated water quality impacts (if observed)
- Re-evaluation and proposed corrective action (if necessary)
- Status of upcoming CSO Control Measures in other watersheds (reporting on status of construction schedules, etc.)

The final Milestone Report, prepared in 2027 after Achievement of Full Operation of the St. Marys River CSO controls, will include an assessment of the combined St. Marys River and Maumee River controls. While the performance of the Maumee River CSO

controls in terms of activations can be assessed in 2024, the full impact of CSO Control Measures on the Maumee River cannot be assessed until implementation of the upstream St. Marys River controls.

4.6.6.2 Final Report

While the Milestone Reports are targeted at the regulatory agencies for the purpose of demonstrating compliance with the Performance Criteria set forth in Table 4.2.4.1, the Final Report is targeted at a broader audience, including Fort Wayne's ratepayers. As explained previously, the City is committed to keeping the public informed on where, how, and to what benefit their money is being spent. Therefore, the Final Report will be based on up to three years of monitoring following Achievement of Full Operation in order to further assess longer-term trends in expected instream water quality improvements.

The City shall develop and submit the Final Post-Construction Monitoring Report to U.S. EPA and IDEM within three years following Achievement of Full Operation of all LTCP projects. The Final Report will consolidate the information described above with respect to each watershed, plus any additional relevant information collected since submittal of the associated Milestone Report. The purpose of the Final Post-Construction Monitoring Report shall be to provide additional documentation on the performance of the fully implemented CSO Control Measures on a system-wide basis (based on an additional CSO activation data), and provide a further assessment of the longer-term trends in expected instream water quality improvements due to implementation of the City's CSO Control Measures.

4.6.6.3 Progress Report to Public

As noted above, a key goal of the City's overall wet-weather control philosophy is to ensure that public monies are spent in an effective and prudent manner. The City takes this obligation very seriously, given that City ratepayers are funding the CSO Control Measures required under the LTCP. Therefore, progress reporting to the public is analogous to informing an owner on the status of his or her investment.

The City has an active public information program related to wet-weather control (as described in Chapter 7 of the CSSOP), and will continue disseminating information on the status of LTCP implementation through this program. Public outreach will be ongoing during LTCP implementation, starting in 2008. The Milestone Reports described above will also provide information for focused public education periods, during which ratepayers will be shown costs to date and any observed trends in improved water quality.

4.6.7 Summary

The City's Post-Construction Monitoring Program is designed to assess the impact of the CSO Long-Term Control Plan. Given the City's investment of hundreds of millions of dollars in wet-weather control, it is critical to have a mechanism to measure benefit. The Post-Construction Monitoring Program will determine, document, and disseminate the

effectiveness of the CSO control program in achieving performance requirements and improving water quality.

The Program includes the following steps:

- Implementation of a defined monitoring program designed to measure reductions in overflow activations and changes in instream water quality.
- Analysis and assessment of flow monitoring data and/or model simulation results to determine whether implemented CSO Control Measures are meeting the Performance Criteria in Table 4.2.4.1.
- Analysis and assessment of water quality data to establish trends in improving instream water quality.
- Preparation of Milestone Reports and a Final Report to document the success of the LTCP implementation, or identify any weak links in the implemented CSO control system and present any necessary corrective action.
- Dissemination of information on LTCP implementation to the Fort Wayne public, including important measures of cost and benefit.

The City's Post-Construction Monitoring Program addresses U.S. EPA and IDEM requirements, as outlined in the CSO Policy, for monitoring the performance of CSO control measures.

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ATTACHMENT 1

CITY OF FORT WAYNE
CSO SATELLITE DISINFECTION PILOT STUDY

1 Introduction

As part of its CSO LTCP implementation process, Fort Wayne shall carry out a study to provide information regarding the effectiveness of the CSO disinfection technology proposed by Fort Wayne for four of its CSOs. Fort Wayne shall carry out this study at the proposed satellite disinfection facility to be constructed at CSO 052 located on the lower St. Joseph River. This study shall be carried out over the course of 18 months, following the attainment of full operation of the referenced satellite CSO disinfection facility. The results of such sampling shall not be used to determine compliance with water quality standards unless the State has by that time adopted standards for these specific pathogens.

2 Sampling

Sampling will be carried out for a total of 5 overflow events for all parameters except for *Cryptosporidium* and *Giardia* which shall be carried out for a total of 3 overflow events. Samples shall be collected just prior to entrance of the wastewater into the treatment unit ("influent"), and after the wastewater has been treated ("effluent"), before it enters the receiving water. All effluent samples shall be collected in duplicate, so as to accommodate the pretreatment procedure described below. All bacteria and viral samples shall be de-chlorinated upon collection, and all samples shall be collected, preserved and handled in accordance with 40 CFR Part 136, and other applicable USEPA guidance.

Grab sample collection during each event will span the time during which the subject control facility is active, beginning as soon as possible after the overflow begins. Samples will then be collected every two hours during the overflow, up to a maximum of five samples per event.

Collected samples will be prepared and analyzed for both conventional pollutants and specific pathogens as described below and as identified in Table 1.

2.1 Sampling Plan/QA/QC Procedures

Fort Wayne will develop appropriate, 40 CFR Part 136-compliant sample collection, storage, preservation, and handling procedures through consultation with the laboratories selected to conduct the analyses. These procedures will be incorporated into a Sampling Plan which will be submitted to EPA for approval one year prior to the date the basin will become operational. The sampling plan will also include the QA/QC procedures developed to insure the quality of the data to be generated. Fort Wayne's QA/QC plan shall be consistent with USEPA's current QAPP guidance document ("Guidance for Quality Assurance Project plans; EPA QA/G-5," December 2002).

3 Parameters and Analytical Procedures

The parameters and methods in Table 1 will be used during this study.

Table 1: Parameters and Analytical Methods

Parameter	Method
Adenoviruses, types 40 and 41	Integrated cell culture (ICC) - real time PCR (EPA 815-B-04-001 - Quality Assurance/ Quality Control Guidance for Laboratories Performing PCR Analyses on Environmental Samples, October 2004)
Shigella	SM 9260 D
Enterococcus	EPA Method 1600: Membrane filter (EPA-821-R-02-022)
Salmonella	SM 9260 C
E. coli	*Escherichia coli* Detection - Membrane Filter Technique (EPA Method 1105)
Bacteroides fragilis bacteriophage	ISO 10705-4
flow volume (or rate)	Continuous measurement
water temperature and air temperature	Field measurement
pH	Field measurement
dissolved oxygen (DO)	Field measurement
turbidity	SM 2130 B
total suspended solids (TSS)	SM 2540 D
Cryptosporidium and *Giardia*	*Cryptosporidium* and *Giardia* in Water by Filtration/IMS/FA (EPA Method 1623)

One split of each effluent sample shall be pre-treated using either mechanical agitation or sonification to break up suspended solids particles and release entrapped organisms that might otherwise fail to enumerate

during the above-listed analyses. As part of its sampling program, Fort Wayne shall carry out initial testing of raw CSO discharge to identify a mixing or sonification procedure that provides sufficient energy to liberate entrapped organisms, but which does not provide sufficient energy to result in organism deactivation. In carrying this initial effluent testing, Fort Wayne shall utilize a series of split samples, and shall submit one set of splits to a range of energy levels. Fort Wayne shall then analyze both sets of split effluent samples for *E. Coli*, and shall note which energy level maximizes the increase in bacteria counts compared to the splits not receiving pretreatment. The resulting procedure shall identify both energy level and time of blending or sonification, and shall employ aseptic methods and conditions.

The City may propose alternate sample preparation or analytical procedures prior to preparing its sampling plan. The City will advise EPA of the alternative procedure(s) it wishes to use, and provide information regarding the nature of these procedures and the reason why alternative procedures are being requested, in order for EPA to determine if the alternative procedure will provide sufficient information to meet the needs of this study.

4 Reporting

The analytical results obtained for each sampling event shall be transmitted to EPA within 60 days of the completion of each sampling event. The report will contain:

- Date and time of sample collection.
- Status of the treatment unit, to include detailed flow information (i.e. event hydrograph) and a description of any operational issues that occurred during the event
- Detailed (15 minute) rainfall data for the event
- Antecedent rainfall - The amount of rainfall in the sewer basin on the two days prior to the overflow event will also be reported.
- Analytical results - Including copies of the actual laboratory reports.
- QA/QC results - Including copies of the laboratory QA/QC results; any discrepancies will be identified and explained by the City.
- Copies of completed chain of custody pages.

At the completion of the sampling period, the City of Fort Wayne shall submit a report that will include all of the above sampling, summarize the results of such sampling including sampling results for the non-pretreated split samples and the pre-treated split samples. Fort Wayne shall compare such samples to NPDES permit limits and, based on those results, recommend measures to be taken by the City to achieve effective disinfection as necessary to comply with defined, numeric water quality standards.

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Long Term Control Plan

Table 4.6.2.1
Post-Construction Monitoring for CSO Control Measures by River Watershed

Watershed	CSO Control Measure[1]		CSOs Controlled (By Overflow Permit ID)	Monitoring Data[2]		Typical Year Performance[3]		Overflow Frequency Performance Criteria Achieved (Yes/No)[4]	Comments
				CSO Volume (MG)	Overflow Frequency By Watershed	CSO Volume (MG)	Overflow Frequency By Watershed[3]		
St. Joseph River	7	Satellite Storage at St. Joseph River CSOs	45, 51, 53, 68						
	8	Satellite Disinfection at St. Joseph River CSOs [5]	52						
Maumee River	5	Pond Storage & Dewatering	67, plus Outfalls 002/003						
	10	Morton Street/O10101 Reroute	48						
	11	Wayne Street Parallel Interceptor	11, 12, 13, 23, 24, 26, 27, 28, 29, 32, 33, 36, 39, 50, 55, 60						
	14	Satellite Storage	54						
	9	Satellite Disinfection[5]	61, 62						
St. Marys River	12	St. Marys Parallel Interceptor	4, 5, 17, 18, 19, 20, 21						
	9	Satellite Disinfection[5]	54						

Footnotes:

(1) CSO Control Measures are listed in LTCP Table 4.2.4.1 along with Achievement of Full Operation (AFO) dates. Note that additional CSO Control Measures, not specific to a particular river watershed, will also be implemented (as outlined in Table 4.2.4.1).

(2) The monitoring period duration, and method to assess Typical Year Performance, will be selected from the options presented in Section 4.6.4.

(3) Typical Year Performance Criteria of 1 overflow event (for the St. Joseph River) or 4 overflow events (for the Maumee and St. Marys Rivers) is based on average annual statistics over a representative five-year period. The method to assess "typical year" performance over a typical 5-year period will be selected from the options presented in Section 4.6.4.

(4) Milestone reports on the achievement of performance criteria will be prepared for each watershed, as described in Section 4.6.6.

(5) The preferred CSO Control Measure for these CSOs is Satellite Disinfection based on the technology screening and selection process conducted by the City. The City will proceed as described in Section 4.6 to conduct a Satellite Disinfection Pilot Study if it ultimately elects to construct one or more Satellite Disinfection facilities. Alternatively, the City may elect to construct Satellite Storage facilities.

Table 4.6.3.1
CSO and Stream Monitoring

Site ID	Location	Receiving Stream	Rationale	Real-time Discharge	Intermittent Water Quality	Monitoring Frequency	Monitoring Protocols
1	Mayhew Road Bridge	St. Joseph	Located upstream of the City service area, representing St. Joseph River water quality without any effects of Fort Wayne urban sources. This location provides an indicator of water quality conditions and loads entering City waterways from upstream watersheds.		X	Monthly on a year-round basis; weekly from April 1 to October 31	pH, Dissolved Oxygen, temperature, *E. coli*, Ammonia-Nitrogen, Total Phosphorus, Total Suspended Solids. In addition, monthly sample only - Cadmium, Copper, Lead & Zinc.
2	Tennessee Avenue Bridge	St. Joseph	Located downstream of St. Joseph River CSOs and prior to confluence with the Maumee River, representing the cumulative impact of CSO and other urban sources. This location will be used to track the impact of St. Joseph River CSO controls.		X	Monthly on a year-round basis; weekly from April 1 to October 31	pH, Dissolved Oxygen, temperature, *E. coli*, Ammonia-Nitrogen, Total Phosphorus, Total Suspended Solids. In addition, monthly sample only - Cadmium, Copper, Lead & Zinc.
3	Ferguson Road Bridge	St. Marys	Located upstream of the City service area, representing St. Marys River water quality without any effects of Fort Wayne urban sources. This location provides an indicator of water quality conditions and loads entering City waterways from upstream watersheds.		X	Monthly on a year-round basis; weekly from April 1 to October 31	pH, Dissolved Oxygen, temperature, *E. coli*, Ammonia-Nitrogen, Total Phosphorus, Total Suspended Solids. In addition, monthly sample only - Cadmium, Copper, Lead & Zinc.
4	Spy Run Bridge	St. Marys	Located downstream of St. Marys River CSOs and prior to confluence with the Maumee River, representing the cumulative impact of CSO and other urban sources. This location will be used to track the impact of St. Marys River CSO controls.		X	Monthly on a year-round basis; weekly from April 1 to October 31	pH, Dissolved Oxygen, temperature, *E. coli*, Ammonia-Nitrogen, Total Phosphorus, Total Suspended Solids. In addition, monthly sample only - Cadmium, Copper, Lead & Zinc.
5	Anthony Boulevard Bridge	Maumee	Located downstream of St. Joseph River and St. Marys River CSOs, and upstream of the WPCP and Pond discharges. This location will be used to track the impact of all upstream CSOs (under current and improved conditions) independent of WPCP and CSO Pond improvements.		X	Monthly on a year-round basis; weekly from April 1 to October 31	pH, Dissolved Oxygen, temperature, *E. coli*, Ammonia-Nitrogen, Total Phosphorus, Total Suspended Solids. In addition, monthly sample only - Cadmium, Copper, Lead & Zinc.
6	Landin Road Bridge	Maumee	Located downstream of Fort Wayne to evaluate the cumulative impact of all CSO Control Measures in the City.		X	Monthly on a year-round basis; weekly from April 1 to October 31	pH, Dissolved Oxygen, temperature, *E. coli*, Ammonia-Nitrogen, Total Phosphorus, Total Suspended Solids. In addition, monthly sample only - Cadmium, Copper, Lead & Zinc.
USGS-1	Anthony Boulevard Bridge	Maumee	USGS Gauging Station #04182900			Continuous	Water stage
USGS-2	Coliseum Boulevard Bridge	Maumee	USGS Gauging Station #04182950	X		Continuous	River flow, water stage
USGS-3	Landin Road Bridge	Maumee	USGS Gauging Station #04183000	X		Continuous	River flow, water stage
USGS-4	Latitude 41°10'38" Longitude 85°03'21"	St. Joseph	USGS Gauging Station #04180500	X		Continuous	River flow, water stage
USGS-5	Anthony Extended Bridge	St. Marys	USGS Gauging Station #04182000	X		Continuous	River flow, water stage
Outfall 003	CSO Pond 1	Maumee	Currently a permitted discharge, but not active; potential future discharge point	X		Continuous	Post-construction monitoring will be via new equipment installed as part of LTCP improvements.
Outfall 002	CSO Pond 2	Maumee	Monitoring required per NPDES permit	X		Continuous	Flow, level, velocity (onset, duration, and volume of overflow)
Outfall 001	WPCP Discharge	Maumee	Monitoring required per NPDES permit	X	X	Daily/Continuous	Per NPDES Permit
CSO 004	Rolling Mills regulator	St. Marys	Monitored CSO for City monthly reporting requirements	X		Continuous	Flow, level, velocity (onset, duration, and volume of overflow)
CSO 005	Foster Park at swing bridge	St. Marys	Monitored CSO for City monthly reporting requirements	X		Continuous	Flow, level, velocity (onset, duration, and volume of overflow)

Table 4.6.3.1
CSO and Stream Monitoring

Site ID	Location	Receiving Stream	Rationale	Real-time Discharge	Intermittent Water Quality	Monitoring Frequency	Monitoring Protocols
CSO 011	Nebraska Pump Station	St. Marys	Monitored CSO for City monthly reporting requirements	X		Continuous	Pump run time meters used to estimate flow (onset, duration, and volume of overflow)
CSO 013	Wayne and Nelson	St. Marys	Monitored CSO for City monthly reporting requirements	X		Continuous	Flow, level, velocity of influent (onset, duration of overflow) plus weir equation
CSO 017	Wildwood and Wildmere	St. Marys	Monitored CSO for City monthly reporting requirements	X		Continuous	Flow, level, velocity (onset, duration, and volume of overflow)
CSO 018	Broadway and Rudisill	St. Marys	Monitored CSO for City monthly reporting requirements	X		Continuous	Flow, level, velocity (onset, duration, and volume of overflow)
CSO 019	Broadway and Rudisill	St. Marys	Monitored CSO for City monthly reporting requirements	X		Continuous	Flow, level, velocity (onset, duration, and volume of overflow)
CSO 020	Herman Road	St. Marys	Monitored CSO for City monthly reporting requirements	X		Continuous	Flow, level, velocity (onset, duration, and volume of overflow)
CSO 021	Century Court	St. Marys	Monitored CSO for City monthly reporting requirements	X		Continuous	Flow, level, velocity (onset, duration, and volume of overflow)
CSO 023	Jackson and Superior	St. Marys	Monitored CSO for City monthly reporting requirements	X		Continuous	Flow, level, velocity (onset, duration, and volume of overflow)
CSO 024	Ewing and Superior (east manhole)	St. Marys	Monitored CSO for City monthly reporting requirements	X		Continuous	Flow, level, velocity (onset, duration, and volume of overflow)
CSO 025	Ewing and Superior (west manhole)	St. Marys	Monitored CSO for City monthly reporting requirements	X		Continuous	Flow, level, velocity (onset, duration, and volume of overflow)
CSO 026	Third Street Pump Station	St. Marys	Monitored CSO for City monthly reporting requirements	X		Continuous	Flow, level, velocity (onset, duration, and volume of overflow)
CSO 028	Glasgow Pump Station	St. Marys	Monitored CSO for City monthly reporting requirements	X		Continuous	Pump run time meters used to estimate flow (onset, duration, and volume of overflow)
CSO 029	Barr and Superior/Clinton and Superior	St. Marys	Monitored CSO for City monthly reporting requirements	X		Continuous	Flow, level, velocity (onset, duration, and volume of overflow)
CSO 032	Superior and Wayne	St. Marys	Monitored CSO for City monthly reporting requirements	X		Continuous	Flow, level, velocity (onset, duration, and volume of overflow)
CSO 033	Third Street Pump Station	St. Marys	Monitored CSO for City monthly reporting requirements	X		Continuous	Pump run time meters used to estimate flow (onset, duration, and volume of overflow)
CSO 036	Westbrook	Spy Run (into St. Marys)	Monitored CSO for City monthly reporting requirements	X		Continuous	Flow, level, velocity (onset, duration, and volume of overflow)
CSO 039	Wayne and Hanna	Maumee	Monitored CSO for City monthly reporting requirements	X		Continuous	Flow, level, velocity (onset, duration, and volume of overflow)
CSO 044	Spy Run extended and Dalgreen	St. Joseph	Monitored CSO for City monthly reporting requirements	X		Continuous	Flow, level, velocity (onset, duration, and volume of overflow)
CSO 045	250 feet east of Spy Run extended and Dalgreen	St. Joseph	Monitored CSO for City monthly reporting requirements	X		Continuous	Flow, level, velocity (onset, duration, and volume of overflow)
CSO 048	Morton Street Pump Station	Maumee	Monitored CSO for City monthly reporting requirements	X		Continuous	Pump run time meters used to estimate flow (onset, duration, and volume of overflow)
CSO 050	Coombs @ CAJ Foods	Maumee	Monitored CSO for City monthly reporting requirements	X		Continuous	Flow, level, velocity (onset, duration, and volume of overflow)
CSO 051	3420 Woodrow Avenue	St. Joseph	Monitored CSO for City monthly reporting requirements	X		Continuous	Flow, level, velocity (onset, duration, and volume of overflow)
CSO 052	Crescent and Springfield/Concordia H.S. parking lot	St. Joseph	Monitored CSO for City monthly reporting requirements	X	X[1]	Continuous	Flow, level, velocity (onset, duration, and volume of overflow). Effluent parameters per NPDES Permit.[2]
CSO 053	1124 St. Joseph River Drive	St. Joseph	Monitored CSO for City monthly reporting requirements	X		Continuous	Flow, level, velocity (onset, duration, and volume of overflow)

Table 4.8.3.1
CSO and Stream Monitoring

Site ID	Location	Receiving Stream	Rationale	Real-time Discharge	Intermittent Water Quality	Monitoring Frequency	Monitoring Protocols
CSO 054	Smith and Belmont	Natural Drain No. 4 (into St. Marys)	Monitored CSO for City monthly reporting requirements	X	X[1]	Continuous	Flow, level, velocity (onset, duration, and volume of overflow). Effluent parameters per NPDES Permit. [2]
CSO 055	Anthony and Wayne	Maumee	Monitored CSO for City monthly reporting requirements	X		Continuous	Flow, level, velocity (onset, duration, and volume of overflow)
CSO 056	Brown Street Pump Station	St. Marys	Monitored CSO for City monthly reporting requirements	X		Continuous	Pump run time meters used to estimate flow (onset, duration, and volume of overflow)
CSO 057	Wayne and Glascow/WPCP in front of headworks	Maumee	Monitored CSO for City monthly reporting requirements	X		Continuous	Flow, level, velocity (onset, duration, and volume of overflow)
CSO 058	East of WPCP	Maumee	Monitored CSO for City monthly reporting requirements	X		Continuous	Flow, level, velocity (onset, duration, and volume of overflow)
CSO 060	Formerly Farrell Gas (east of Omin Source offices)	Un-named ditch (to Maumee)	Monitored CSO for City monthly reporting requirements	X		Continuous	Flow, level, velocity (onset, duration, and volume of overflow)
CSO 061	Coliseum and State	Baldwin Ditch (to Maumee)	Monitored CSO for City monthly reporting requirements	X	X[1]	Continuous	Flow, level, velocity (onset, duration, and volume of overflow). Effluent parameters per NPDES Permit. [2]
CSO 062	State and Laverne	Baldwin Ditch (to Maumee)	Monitored CSO for City monthly reporting requirements	X	X[1]	Continuous	Flow, level, velocity (onset, duration, and volume of overflow). Effluent parameters per NPDES Permit. [2]
CSO 064	Pontiac	Un-named ditch (to Maumee)	Monitored CSO for City monthly reporting requirements	X		Continuous	Flow, level, velocity (onset, duration, and volume of overflow)
CSO 068	Glazier and North Side Drive	St. Joseph	Monitored CSO for City monthly reporting requirements	X		Continuous	Flow, level, velocity (onset, duration, and volume of overflow)
CSO 080	Alley beside 2316 Kensington/alley beside 1815 E. State Boulevard	Baldwin Ditch (to Maumee)	Monitored CSO for City monthly reporting requirements	X		Continuous	Flow, level, velocity of influent (onset, duration of overflow) plus weir equation

(1) Intermittent Water Quality monitoring required only if Satellite Disinfection technology constructed.

(2) If Satellite Disinfection technology is utilized, NPDES effluent limits shall be as noted in Section 4.6.

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Consent Decree
Appendix 5

Sanitary Sewer Discharges to Be Eliminated

SANITARY SEWER DISCHARGES TO BE ELIMINATED

Rothman SSD System

The Rothman SSD System consists of structures T46 089 (outfall 072 of the Current Permit), T46 004 (outfall 073 of the Current Permit), T34 035 (outfall 074 of the Current Permit), T34 028 (outfall 075 of the Current Permit), and T34 024 (outfall 076 of the Current Permit). The Achievement of Full Operation of improvements necessary to eliminate SSDs from these structures shall occur on or before December 31, 2011.

Warfield SSD System

The Warfield SSD System consists of structures N23 121 (outfall 070 of the Current Permit) and N23 122 (outfall 071 of the Current Permit). The Achievement of Full Operation of improvements necessary to eliminate SSDs from these structures shall occur on or before December 31, 2011.

North Maumee SSD System

The North Maumee SSD System consists of structures V10 001 (outfall ___ of the Current Permit) and V06 001 (outfall ___ of the Current Permit). The Achievement of Full Operation of improvements necessary to eliminate SSDs from these structures shall occur on or before December 31, 2020.

[Outfall numbers for the North Maumee SSD system are to be assigned via the proposed modified NPDES permit that IDEM issued for public notice and comment on November 23, 2007.]

United States and State of Indiana v. City of Fort Wayne, Indiana

Consent Decree
Appendix 6

Federal Supplemental Environmental Project Plan

CITY OF FORT WAYNE, INDIANA

FORT WAYNE CITY UTILITIES

Supplemental Environmental Project

Septic System Elimination Program

TO:

The United States Environment Protection Agency

December 2007

The City of Fort Wayne (City) provides municipal sewage treatment and/or conveyance services to nearly 85% of the developed area in the Fort Wayne Metropolitan area. This represents approximately 80,000 sanitary sewer customers. The City system includes the operation of sewage treatment plant with a current peak capacity of 60 MGD and over 1,100 miles of sanitary sewer piping. The central area of the City is served by a combined sewer system.

The City's Long-Term Control Plan (LTCP) contemplates watershed-based solutions to control combined sewer overflows (CSOs). These solutions will be implemented over the next 18 years as described in the LTCP. In effort to continue improving water quality and enhance public health and the environment, the City has identified septic systems as a non-CSO related pollution source that has the potential to impair the City's CSO receiving streams. The Supplemental Environmental Project (SEP) described below is intended to help address this non-CSO related pollution source.

SEPTIC SYSTEM ELIMINATION PROGRAM

Project Overview and Purpose

The City proposes to undertake efforts focused on the elimination of failed or failing septic systems located throughout its service area with a focus on those located within developed/urban areas. This SEP will include a 4-year $400,000 investment that will eliminate 133 existing septic systems in high priority areas within said 4 years. The City is not required by any law or ordinance to complete the work described in this SEP.

There are currently approximately 1,600 septic systems within the City's sanitary sewer service area. Of these approximately 1,600, approximately 500 are located within the serviceable area of Fort Wayne's City limits. Septic systems have a limited life and generally afford unpredictable performance over time. Failing septic systems often lead to human exposure to bacteria, including E. coli, which ultimately appears in neighborhood streams and ditches and even in yard areas when systems 'boil' up out of the ground. Having these conditions within densely developed areas creates a greater risk of human exposure. To better mitigate these risks to area waters and residents, the City has developed this proposed SEP which will serve to help eliminate septic systems within City limits.

The City has identified and evaluated approximately 130 areas inside and/or near the City service area where clusters of homes are served by private on-site waste treatment or septic systems. The attached Exhibit identifies these potential septic relief areas. The clusters may contain as few as three or four or as many as 100 or more individual septic systems. Fort Wayne has evaluated cluster areas of septic systems for serviceability, constructability and environmental impact.

In septic system neighborhoods, most home's sewage exits from a tank system on the private property via a gravity discharge pipe. These pipes may discharge into a common pipe (often referred to as a septic drain line or field tile) that conveys the sewage to the nearest open ditch,

stream, river or other waterway. These septic system drain lines can convey septic waste thousands of feet underground through piping before the effluent is ultimately discharged into an open waterway. While some discharging septic systems that have been properly maintained may discharge effluent that meets water quality standards, many systems discharge high levels of bacteria that can eventually make its way to an area ditch, drain, stream or river. The proximity of septic systems to local waterways can be observed on the attached Exhibit.

Research performed by Purdue University estimates that one-quarter of the septic systems in the State have failed or are failing. They have also estimated that every failing system can discharge more than 76,650 gallons of untreated wastewater to groundwaters and surface waters per year. That means that the estimated 500 failing septic systems in Fort Wayne and the City's serviceable area are introducing approximately 38,000,000 gallons of raw or only partially treated sewage into the environment annually.

Untreated wastewater contains excessive nutrients (nitrogen and phosphorus) that can harm native plant and fish populations and it can choke off the oxygen supply in surface waters and eventually lead to gradual environmental degradation. Untreated or partially treated wastewater can also lead to microbial populations in these surface waters exceeding regulatory full-body contact standards.

Fort Wayne's Septic System Elimination Program will eliminate this risk within the areas of septic system removal and reduce impacts to local groundwater and surface waters by transporting this wastewater to the City's Water Pollution Control Plant for treatment. It is estimated that this program will account for the elimination of approximately 26% of the septic systems located within the service area of the City.

City staff will oversee the implementation of the Septic System Elimination Program through its Capital Improvement Program. This will include planning, designing, bidding and managing the construction of the projects. The program will also entail working with the various neighborhoods and property owners within these areas by holding pubic information meetings and sending out mailings. A cost-share program, as noted below, will be adopted and administered by the City that provides for a sanitary sewer utility subsidy for each affected property.

Project areas will be selected based on various criteria including: failure rate of existing septic systems and associated impacts (as provided by the local Board of Health), impact on the City's drinking water source (St. Joseph River), constructability and degree of property owner interest and involvement in the project

Project Scope, Schedule and Cost

The total engineering and construction (capital) costs for the elimination of 133 septic systems is estimated to be approximately $1,899,000. The City will adopt a cost share program that provides a sanitary sewer utility subsidy for each benefited property. This City subsidy will be applied toward engineering and construction-related costs for the various projects and is estimated to be $400,000 (at a minimum). This contribution of $400,000 represents

approximately 21% of the estimated cost of the engineering & construction (capital) portions of the program. The remaining approximately $1,499,000 of capital costs is anticipated to be paid by the benefited property owners. Additionally, the City will offer and administer a robust finance program for property owners that will include multi-year financing options to assist individual property owners in paying for their share of the cost of the sanitary sewer extension project. City administrative costs for overall program management and the financing program implementation are not included in the $400,000 program costs, all of which represents capital costs (no one-time non-depreciable expenditures or annual recurring costs are included within the estimated $400,000 contribution).

Consistency with U.S. EPA SEP Policy

According to the U.S. EPA SEP policy (May 1, 1998):

> *To further EPA's goals to protect and enhance public health and the environment, in certain instances environmentally beneficial projects, or Supplemental Environmental Project (SEPs), may be part of the settlement.*

The proposed SEP described above is consistent with the U.S. EPA's Policy. Notably:

- This SEP proposes work that will be environmentally beneficial to Fort Wayne's receiving waters and protective of public health.
- The City agrees to undertake this project in settlement of an enforcement action.
- The City is not otherwise legally required to perform this project.

Progress Reports

The City will submit to U.S. EPA progress reports upon implementation of the SEP project along with each milestone report required under the Consent Decree. Each progress report will provide the status of the Septic System Elimination Program, and will provide information about any elements of the program that were completed during the reporting period.

Modification/Substitution of Projects

The City may modify the project or may substitute a similar project for the Septic System Elimination Program identified above with the advance written approval of U.S. EPA provided that the alternative SEP represent costs at least equal to those described herein for the Septic System Elimination Program.

Substantial Compliance

The City will be in compliance with the requirement to implement this SEP provided it eliminated 133 septic systems by December 31, 2011 and documents the same in the required SEP Completion Report.

SEP Completion Report

Within 120 days after completion of the SEP, the City shall submit to U.S. EPA a final SEP Completion Report documenting the City's elimination of 133 septic systems. Upon U.S. EPA's written acceptance of that completion report, the City shall be deemed to have satisfactorily completed this SEP.

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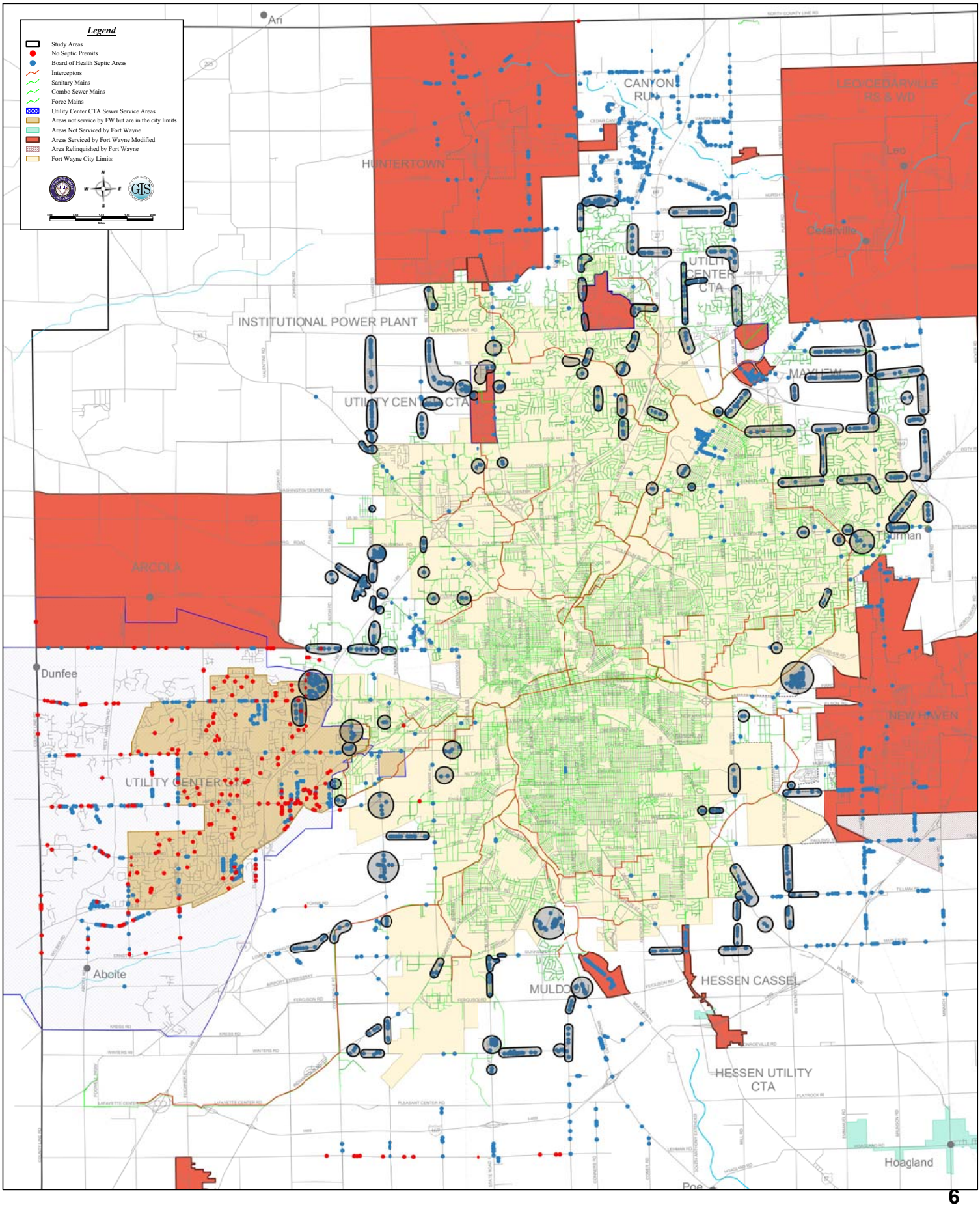
Legend
Study Areas
No Septic Premits
Board of Health Septic Areas
Interceptors
Sanitary Mains
Combo Sewer Mains
Force Mains
Utility Center CTA Sewer Service Areas
Areas not service by FW but are in the city limits
Areas Not Serviced by Fort Wayne
Areas Serviced by Fort Wayne Modified
Area Relinquished by Fort Wayne
Fort Wayne City Limits
Ari
HUNTERTOWN
CANYON RUN
LEO/CEDARVILLE RS & WD
Leo
Cedarville
UTILITY CENTER CTA
INSTITUTIONAL POWER PLANT
UTILITY CENTER CTA
MAYHEW
ARCOLA
Dunfee
NEW HAVEN
UTILITY CENTER CTA
Aboite
MULDOON
HESSEN CASSEL
HESSEN UTILITY CTA
Hoagland
Poe

United States and State of Indiana v. City of Fort Wayne, Indiana

Consent Decree
Appendix 7

State Supplemental Environmental Project Plans

CITY OF FORT WAYNE, INDIANA

FORT WAYNE CITY UTILITIES

Supplemental Environmental Projects

Septic System Elimination Program
And
RAIN GARDEN DEMONSTRATION AND INCENTIVE PROGRAM

TO:

The Indiana Department of Environmental Management

December 2007

The City of Fort Wayne (City) provides municipal sewage treatment and/or conveyance services to nearly 85% of the developed area in the Fort Wayne Metropolitan area. This represents approximately 80,000 sanitary sewer customers. The City system includes the operation of a sewage treatment plant with a current peak capacity of 60 MGD and over 1,100 miles of sanitary sewer piping. The central area of the City is served by a combined sewer system.

The City's Long-Term Control Plan (LTCP) contemplates watershed-based solutions to control combined sewer overflows (CSOs). These solutions will be implemented over the next 18 years as described in the LTCP. In an effort to continue improving water quality and to enhance public health and the environment, the City has identified non-CSO related pollution sources that have the potential to impair the City's CSO receiving streams. The two independent State Supplemental Environmental Projects (SEPs) described below are intended to help address two of those non-CSO related pollution sources.

STATE SEPTIC SYSTEM ELIMINATION PROGRAM SEP

Project Overview and Purpose

For the first of its two independent State SEPs, the City proposes to undertake efforts focused on the elimination of failed or failing septic systems located throughout its service area with a focus on those located within developed/urban areas. This SEP will include a four-year $126,000 investment in sanitary sewer line extensions that will eliminate 42 existing septic systems in high priority areas within said four years. The City is not being required by any regulatory agency, ordinance of any agency, or as a result of any existing litigation or settlement to eliminate septic systems via public sewer extensions.

There are currently approximately 1,600 septic systems within the City's sanitary sewer service area. Of these approximately 1,600, approximately 500 are located within the serviceable area of Fort Wayne's City limits. Septic systems have a limited life and generally afford unpredictable performance over time. Failing septic systems often lead to human exposure to bacteria, including E. coli, which ultimately appears in neighborhood streams and ditches and even in yard areas when systems 'boil' up out of the ground. Having these conditions within densely developed areas creates a greater risk of human exposure. To better mitigate these risks to area waters and residents, the City has developed this proposed SEP which will serve to eliminate septic systems within and near the City limits.

The City has identified and evaluated approximately 130 areas inside and/or near the City service area where clusters of homes are served by private on-site waste treatment or "septic" systems. The attached Exhibit identifies these potential septic relief areas. The clusters may contain as few as three or four or as many as 100 or more individual septic systems. Fort Wayne has evaluated these cluster areas of septic systems for serviceability, constructability and environmental impact.

In septic system neighborhoods, most home's sewage exits from a tank system on the private property via a gravity discharge pipe. These pipes may discharge into a common pipe (often

referred to as a septic drain line or field tile) that conveys the sewage to the nearest sewer (if one exists) or to the nearest open ditch, stream, river or other waterway. In un-sewered areas, these septic system drain lines can convey septic waste thousands of feet underground through piping before the effluent is ultimately discharged into an open waterway. While some discharging septic systems that have been properly maintained may discharge effluent that meets water quality standards, many systems discharge high levels of bacteria that can eventually make its way to an area ditch, drain, stream or river. The proximity of septic systems to local waterways can be observed on the attached Exhibit.

Research performed by Purdue University estimates that one-quarter of the septic systems in the State have failed or are failing. They have also estimated that every failing system can discharge more than 76,650 gallons of untreated wastewater to the groundwaters and surface waters per year. That means that the estimated 500 failing septic systems in the Fort Wayne area are introducing approximately 38,000,000 gallons of raw or only partially treated sewage into the environment annually.

Untreated wastewater contains excessive nutrients (nitrogen and phosphorus) that can harm native plant and fish populations and it can choke off the oxygen supply in surface waters and eventually lead to gradual environmental degradation. Untreated or partially treated wastewater can also lead to microbial populations in these surface waters exceeding regulatory full-body contact standards.

Fort Wayne's State Septic System Elimination Program will eliminate this risk within the areas of septic system removal and reduce impacts to local groundwater and surface waters by transporting this wastewater to the City's Water Pollution Control Plant for treatment. It is estimated that this program will account for the elimination of approximately 8% of the septic systems located within the City and its service area of the City.

City staff will oversee the implementation of the Septic System Elimination Program through its Capital Improvement Program. This will include planning, designing, bidding and managing the construction of the projects. The program will also entail working with the various neighborhoods and property owners within the identified areas by holding pubic information meetings and sending out mailings. A cost-share program, as noted below, will be adopted and administered by the City that will provide a sanitary sewer utility subsidy for each affected property.

Project areas will be selected based on various criteria including: failure rate of existing septic systems and associated impacts (as provided by the local Board of Health), impact on the City's drinking water source (St. Joseph River), constructability and degree of property owner interest and involvement in the project

Project Scope, Schedule and Cost

The total engineering and construction cost for the elimination of 42 septic systems is estimated to be approximately $599 thousand. The City will adopt a cost share program that provides a sanitary sewer utility subsidy for each benefited property. This City subsidy will be applied

toward engineering and construction-related costs for the various projects and is estimated to be $126,000 (at a minimum). This contribution of $126,000 represents approximately 21% of the estimated cost of the engineering & construction portions of the program. The remaining approximately $473 thousand is anticipated to be paid by the benefited property owners. Additionally, the City will offer and administer a robust finance program for property owners that will include multi-year financing options to assist individual property owners in paying for their share of the cost of the sanitary sewer extension project. City administrative costs for overall program management and the financing program implementation are not included in the $126,000 program costs, all of which represents capital costs (no one-time non-depreciable expenditures or annual recurring costs are included within the estimated $126,000 contribution).

Consistency with SEP Policy

The proposed SEP described above is consistent with the IDEM's Supplemental Environmental Project Policy. Notably:

- This SEP proposes work that will be environmentally beneficial to Fort Wayne's receiving waters and protective of public health.
- The City agrees to undertake this project in settlement of an enforcement action.
- The City is not otherwise legally required to perform this project.

Progress Reports

The City will submit to IDEM progress reports upon implementation of the SEP project along with each milestone report required under the Consent Decree. Each progress report will provide the status of the State Septic System Elimination Program, and will provide information about any elements of the program that were completed during the reporting period.

Modification/Substitution of Projects

The City may modify the project or may substitute a similar project for the State Septic System Elimination Program identified above with the advance written approval of IDEM provided that the alternative SEP represent costs at least equal to those described herein for the State Septic System Elimination Program.

Substantial Compliance

The City will be in compliance with the requirement to implement this SEP provided it spends $126 thousand toward septic tank elimination by December 31, 2011 and documents such expenditures in the required SEP Completion Report.

SEP Completion Report

Within 120 days after completion of the SEP and/or the expenditure of at least $126 thousand toward the same, the City shall submit to IDEM a final SEP Completion Report documenting the

City's expenditures on toward this SEP and its completion. Upon IDEM's written acceptance of that completion report, the City shall be deemed to have satisfactorily completed this SEP.

RAIN GARDEN DEMONSTRATION AND INCENTIVE PROGRAM SEP

In addition to the State Septic System Elimination Program SEP described above, the City proposes to perform a SEP focused on reducing water pollution through the creation of demonstration rain gardens in learning environments and other public locations and developing incentives for the creation and maintenance of residential rain gardens. Much of this SEP project would be carried out within Fort Wayne's combined sewer area, although some rain gardens would be installed in suburban areas served by separate storm sewers.

Project Overview and Purpose

The City is proposing a rain garden program that would first establish demonstration rain gardens at a number of public locations, including public parks and schools, in the Fort Wayne area. The demonstration gardens would be designed and plants would be paid for by the City, and would be created through a cooperative effort involving Fort Wayne City Utilities, the Purdue University Cooperative Extension Agency's Master Gardener program, Indiana University-Purdue University Fort Wayne, area school corporations, the Fort Wayne Parks and Recreation Department, teachers and students. As they are being established and maintained, the gardens at schools would be used as part of an environmental curriculum developed within the SEP. A second part of the rain garden program would provide financial incentives for residential property owners who would agree to establish and maintain rain gardens on their own properties.

Rain gardens have the potential to decrease stormwater runoff and thus peak stream flows and the amount of stormwater going into combined sewers in some areas. The EPA website states that green infrastructure, including rain gardens, can protect surface waters and drinking water supplies. It goes on to site levels of pollutant removal levels for metals, phosphorus and nitrate that bioretention can be expected to accomplish (see attached).

The Center for Neighborhood Technology in 2007 published "Green Infrastructure Performance: Results of Monitoring Best Management Practices." The paper cites a paired watershed study done in Burnsville, MN that showed installation of rain gardens within a watershed reduced runoff volumes by 89 to 92 percent when compared with a watershed where no rain gardens were installed.

Research literature shows that rain gardens are particularly effective at reducing solids and nutrients in Stormwater runoff from residential yards and parking lots. A study at the H.B. Fuller lot in St. Paul, MN cited in a presentation by EPA Region 5 found that a wetland area built into a parking lot to capture runoff reduced stormwater runoff volume by 73%, particulate matter export by 94% and phosphorus loading by 70%. (Van der Kloot, 2006). Research done by the Center for Watershed Protection found that "bioretention facilities" installed in parking lots reduced total phosphorus measured in runoff by 65%, total nitrogen by 49%, and metals by 95 – 97% (Quigley and Lawrence, 2001).

A study conducted in Haddam, CT involving replicate rain gardens assessed whether the creation of a saturated zone in a rain garden improved retention of pollutants. The study found that

concentrations of nitrite+ nitrate-N, ammonia-N, and total-N (TN) in roof runoff were significantly reduced by the rain gardens. Rain garden mulch was found to be a sink for metals, nitrogen and phosphorus. (Dietz and Clausen, 2006)

Based on this cursory review of research literature, and based on the fact that rain garden incentive programs are specifically cited in the document "Project Ideas for Potential Supplemental Environmental Projects" updated in July of 2006 and provided to EPA administrators and staff, Fort Wayne proposes the use of rain gardens for the reduction of storm water and storm water pollutants discharged to sewer systems. Further, based on the idea that concentrations of nutrients and metals in water bodies can pose a human health threat, use of a technology that reduces these pollutants should reduce human health threats. Fort Wayne would expect stormwater volume and pollutant reductions in localized areas to be similar to those found in the studies cited above.

Project Scope, Schedule and Cost

The rain garden demonstration and incentive program would begin with the establishment of criteria to be used to select public sites for demonstration rain gardens. Fort Wayne would establish demonstration gardens in the three major CSO-impacted watersheds. The City would work with the Fort Wayne Parks and Recreation Department, public and private school corporations, the Indiana University-Purdue University campus and the Purdue Cooperative Extension Service to identify appropriate locations for rain gardens where they can have the greatest impact on stormwater quantity and quality management. These public agencies would be asked to designate areas on property owned by them where the City could install a demonstration rain garden. Fort Wayne does not propose to purchase any property as part of this program. The City of Fort Wayne would completely fund the installation of 20 demonstration rain gardens of approximately 2,000 square feet each. Approximately 40% of the demonstration gardens will be located within the City's combined sewer area. The estimated cost for a 2,000 square foot rain garden is $12,000 based on a single quote acquired from a Fort Wayne based environmental design and restoration company and includes the cost of design and plants. Labor costs are not included as labor is expected to be done by volunteers. Thus, the total investment by the City in demonstration gardens would be $240,000.

The City would also fund the development of an education module to be used exclusively by students in the schools where rain gardens are located. The curriculum would be customized for elementary, middle and high school students. The curriculum is not targeted at the general public and would not be distributed beyond the schools where rain gardens have been installed as a result of this rain garden demonstration program. Because the curriculum material is not intended for general public educational awareness, this proposal should be consistent with Section D, Part 9(a) of the "EPA Supplemental Environmental Projects Policy."

A consultant will be hired to develop a curriculum that will correlate with Indiana science standards but will also include modules that can be used to teach math, language arts and other subjects. The curriculum will be geared to the age of the students attending the schools where gardens are installed. The curricular material will include general information about what a rain garden is and how it works, sizing, simple soil type and infiltration evaluation, basic hydrology,

plant selection (based on weather zone), native plants and plant history of the area, awareness of invasive species, principles of landscape architecture and visual design principles.

The estimated cost for curriculum development is $50,000. This estimate for the development and printing of an education module is based on the cost approved by the Indiana Department of Environmental Management for a watershed curriculum for use in schools being developed by the St. Joseph River Watershed Initiative.

Once the gardens are installed, students and teachers in the specific schools where the gardens are located will be asked to maintain the gardens. This may include pulling weeds, adding plants, moving mulch, minimal watering, trimming, and preparing the gardens for winter. The school curriculum will incorporate information about how plants use nutrients, plant seeding and reproduction and the risks and management of invasive species.

The materials developed as part of the school curriculum will be provided only to the participating school corporations and their teachers. While volunteers from the City and from the Master Gardener's program may be recruited to assist with "teaching" the curriculum or maintaining the garden, the purpose of using volunteers is only to help educate students in classrooms in schools where rain gardens are located. Volunteers will not be trained as a means to do general public educational awareness, but to educate students. The rain gardens would be installed and education module available for use by December 31, 2014.

The City will promote the installation of rain gardens on private residential property by offering an incentive of $100 each to homeowners who install rain gardens. Homeowners would be required to construct a rain garden in accordance with general guidelines and standards established by the City and would be asked to maintain the gardens following construction. Once the garden is installed at the property owner's expense, the property owner could apply to the City to receive the $100 incentive as a reimbursement. The property owner could apply the reimbursement from the City to offset some of the plant or installation costs for the rain garden. Fort Wayne has set a goal of facilitating the creation of 1,000 rain gardens by the end of 2014.

The City will create a "how to" manual that would be provided to home owners. It would include the City's guidelines for sizing the garden, making soil amendments, plant selection and maintenance. Development and printing of the how-to manual will cost an estimated $30,000. Graphic design and printing costs for the "how to" manual are based on costs for similar publications produced by the City of Fort Wayne. The salary cost includes labor and burden for one employee who would research and write the manual. In developing the manual, the City will consult the Indiana Storm Water Quality Manual (www.idem.in.gov/stormwater).

The City's total investment in rain garden demonstration and incentive program through this SEP will be $420,000. Program cost details and funding sources are shown in the table below:

	Demonstration Rain Gardens 20 @ 2,000 sq. ft.	Educational curriculum and material for school	Residential rain garden incentives for 1,000	Develop and print 1,000 copies of rain garden "How	Total cash or in kind

	each @ $12,000	students	gardens at @$100 each	To" manual 40 hrs staff time at $40 per hour, $5,000 to graphic designer for layout, $23,400 for printing 1,000 @ approx $20 per book plus set up	
City of Fort Wayne	$240,000 cash to contractor	$ 50,000 cash to contractor	$100,000 cash payments to property owners	$1,600 salary $ 28,400 cash payment to contractor = $30,000	$420,000 cash
Fort Wayne Community and other area public and private school systems In-kind support	10 garden spaces @ 2,000 sq. ft. each @ land price of $1.00 per sq. ft. = $20,000	Advising on curriculum requirements and appropriateness of material for various age groups 40 hours at $40 per hour = $1,600	$0	$0	$ 21,600 in-kind
Purdue Cooperative Extension Service Master Gardener Program In-kind support	$0	Review of material for appropriateness for area soils and weather conditions, advising on maintenance, classroom presentations 100 hours @ $25 per hour = $2,500	$0	Review of material for appropriateness for area soils and weather conditions, constructability and functionality based on sizing and preparation suggested in manual 60 hours @ $25 per hour	$ 4,000 in-kind

				= $1,500	
Indiana University/ Purdue University Fort Wayne In-kind support	10,000 sq. ft of rain garden space @ land value of $1.00 per sq. ft = $10,000	$0	$0	$0	$ 10,000 in-kind
Fort Wayne Department of Parks and Recreation In-kind support	10,000 sq. ft. of rain garden space @ land value of $1.00 per sq. ft. = $10,000	$0	$0	$0	$ 10,000 in-kind
Total cash investment	$240,000	$50,000	$100,000	$ 30,000	$420,000
Total anticipated in-kind (non-monetary) support	$ 40,000	$ 4,100	$0	$ 1,500	$ 45,600

Consistency with SEP Policy

Fort Wayne's proposed Rain Garden Demonstration and Incentive Program is consistent with IDEM's Supplemental Environmental Project Policy. IDEM's Supplemental Environmental Project Policy (April 1999) seeks to encourage and obtain environmental and public health protection and improvements that would not occur without the incentives provided by the Policy. IDEM encourages the use of SEPs that are consistent with its Policy because these voluntary

supplemental environmental projects offer significant additional environmental or public health protection, beyond what is required in settlement of an enforcement action.

City's proposed SEP is consistent with IDEM's Supplemental Environmental Project Policy in that:

- There is a direct relationship between the underlying consent decree concerns (river and stream water quality) and the human and environmental benefits that will result from the SEP. The installation of a total of 120 rain gardens can reduce the rate of stormwater runoff from public and residential properties, thereby reducing the flow of stormwater and the pollutants it carries. In combined sewer areas, the use of rain gardens can reduce the amount of stormwater going into combined sewers.
- This SEP reduces risks to public health and the environment.
- The City, while not legally obligated to implement this project, will promote pollution prevention and environmental justice by creating this SEP.

Rain gardens developed under this program are intended to be for demonstration purposes only and for the enjoyment of those who may come into contact with them.

There will be no financial arrangement between the City of Fort Wayne and Purdue University for such a garden is one is developed on the campus or on the property of the Purdue Cooperative Extension Service. The City is not proposing to pay the University for the right to locate a rain garden on any property owned by the University. Any support that the University and its staff may provide will be voluntary and in-kind. If required by the University, (or any school corporation where a demonstration rain garden is proposed) and City may enter into an intergovernmental agreement that would allow the City to install a rain garden on property designated by the University (or other partner agency). It is the City's hope that such an agreement will not be needed and that volunteers from the University will want to build and plant the rain garden based on a design provided and paid for by the City.

Rain garden incentive programs are specifically cited in the U.S. EPA memorandum titled "Project Ideas for Potential Supplemental Environmental Projects" from Assistant Administrator Granta Y. Nakayama dated July 20, 2006.

Progress Reports

The City will submit to IDEM progress reports upon implementation of the SEP project along with each milestone report required under the Consent Decree. Each progress report will provide the status of the Rain Garden Demonstration and Incentive Program components identified above, and will provide information about any elements within those projects that were completed during the reporting period.

Modification/Substitution of Projects

The City may modify the project or may substitute a similar project for the Rain Garden Demonstration and Incentive Program identified above with the advance written approval of

IDEM provided that the alternative SEP represent costs at least equal to those described herein for the Rain Garden Demonstration and Incentive Program.

Substantial Compliance

The City will be in compliance with the SEP requirements provided it spends a total of $420,000 toward the installation of demonstration rain gardens and rain garden incentives by December 31, 2014 and documents the expenditures in the required SEP completion report.

SEP Completion Report

Within 120 days after either 1) completion of the Rain Garden Demonstration and Incentive Program, or 2) the expenditure of at least $420,000 toward accepted alternative projects the City shall submit to IDEM a final SEP Completion Report documenting the expenditures and the projects that have been completed.

RESOURCES AND REFERENCES

Dietz, Michael E. and Clausen, John C. "Saturation to Improve Pollutant Retention in a Rain Garden," *Environ. Sci. Technol.*, 40 (4), 1335 – 1340, 2006

Green Infrastructure Performance: Results of Monitoring Best Management Practices. 2007. Center for Neighborhood Technology, Chicago, IL.

Quigley, Martin F. and Lawrence, Timothy. *Multi-Functional Landscaping: Putting Your Parking Lot Design Requirements to Work for Water Quality*. 2001. Ohio State University, Columbus, OH.

Van der Kloot, Jim. "Green Brownfields Retrofit," *Collaborative Cleanups II*, Bretton Woods, NH, May 4-5, 2006.

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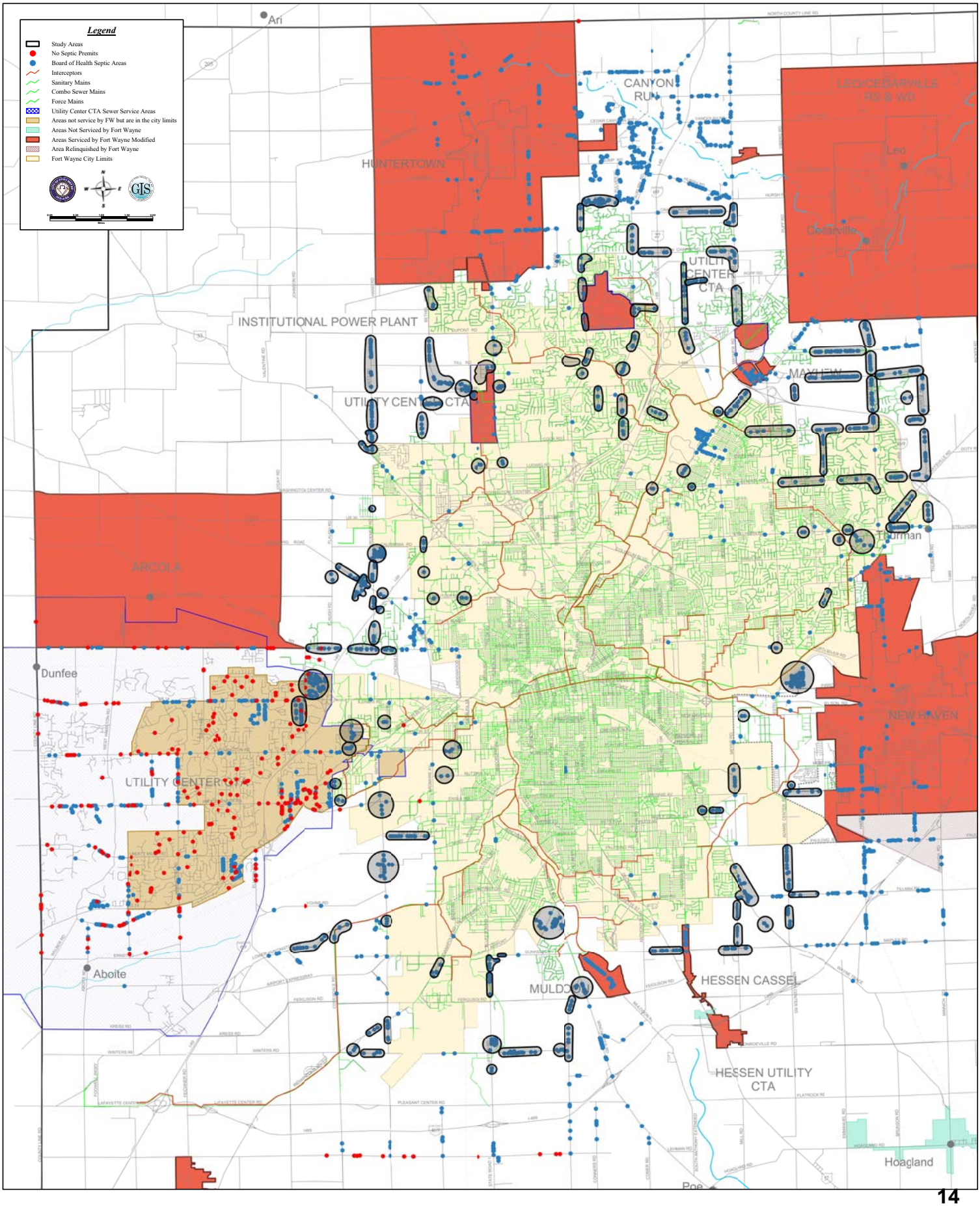
Legend
Study Areas
No Septic Premits
Board of Health Septic Areas
Interceptors
Sanitary Mains
Combo Sewer Mains
Force Mains
Utility Center CTA Sewer Service Areas
Areas not service by FW but are in the city limits
Areas Not Serviced by Fort Wayne
Areas Serviced by Fort Wayne Modified
Area Relinquished by Fort Wayne
Fort Wayne City Limits
Ari
HUNTERTOWN
CANYON RUN
LEO/CEDARVILLE RS & WD
Leo
Cedarville
UTILITY CENTER CTA
INSTITUTIONAL POWER PLANT
UTILITY CENTER CTA
MAYHEW
ARCOLA
Dunfee
NEW HAVEN
UTILITY CENTER CTA
Aboite
MULDOON
HESSEN CASSEL
HESSEN UTILITY CTA
Hoagland
Poe